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*Service Engagement in Psychosis:
The Role of Psychological Variables*

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Submitted in part fulfilment of the degree of
Doctorate in Clinical Psychology
The University of Edinburgh
2018

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Research Portfolio Abstract

Introduction: In psychosis, low engagement with mental health services is both prevalent and frequently associated with negative outcome. The overarching objective of this thesis was to investigate the role of psychological variables in service engagement in people with psychosis. A systematic review was conducted to examine the evidence for clinical and psychological correlates of engagement. An empirical study sought to investigate the association between engagement and psychological variables of a relational nature (i.e. mentalizing and interpersonal functioning).

Methods: A systematic search strategy across four electronic databases yielded seventeen journal articles. For the empirical study, forty-two people with multiple-episode psychosis completed self-report measures of service engagement, symptoms, mentalizing and interpersonal functioning, within a cross-sectional design.

Results: The review found relatively robust evidence supporting the association between engagement and numerous clinical variables. Eleven psychological variables were revealed as significant correlates of service engagement, encompassing developmental, individual and relational factors. Assessment of quality and risk of bias highlighted a number of limitations within included studies. In the empirical study, greater cognitive/disorganization symptomology was predictive of lower service engagement. Service engagement was significantly correlated with mentalizing, but not with interpersonal functioning. The relationship between cognitive/disorganized symptomology and engagement was not mediated by mentalizing performance.

Conclusion: Numerous psychological variables are associated with service engagement, which has the potential to inform clinical practice in view of enhancing engagement. Qualitative and longitudinal studies with both service user and provider samples are required to capture the contextual information surrounding fluctuations in levels of engagement.

Lay Summary

This thesis investigates the psychological factors that may influence how people with psychosis engage in support and treatment with mental health services. Psychosis is a term that captures a wide range of experiences, including hearing voices, believing things that others may find strange and appearing out of touch with reality. Psychosis may also involve feeling withdrawn, unmotivated and apathetic. It is estimated that up to 25% of people who experience psychosis do not engage with support from mental health services. Low levels of engagement with services can involve avoiding seeking help, difficulties with maintaining healthy relationships with professionals, or declining to take prescribed medication. Low engagement with services compromises the safety and quality of life of many people with psychosis.

This thesis reviewed published research in a systematic manner to reveal whether ‘psychological’ factors are linked to engagement. ‘Psychological’ factors can include things such as personality, traumatic childhood experiences or social skills. Results of the review showed that eleven of the thirteen studied psychological factors appear to be linked to engagement, including how well we understand ourselves and other people, and how well we get along with others.

To explore this further, we met with forty-two people with psychosis, who completed questionnaires about their engagement with mental health services, how well they understand themselves and others, and how well they get along with other people. They also answered questions about the severity of their psychosis symptoms. Results revealed that the participants’ ability to understand themselves and others was linked to their levels of engagement with services. The results also highlighted that people who have greater cognitive symptoms of psychosis (i.e. difficulties with thinking skills) are likely to be less engaged with mental health services.

The results of this research may guide mental health staff in selecting approaches and treatments in order to enhance engagement. Future research on this topic should focus on understanding how and why engagement changes over time, by asking people to complete questionnaires and answer questions on several occasions over time. Research should also focus on the reasons why some people are more engaged than others, by talking to people in depth about what helps and hinders them in engaging with mental health services.

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*Clinical and Psychological Correlates of
Service Engagement in Psychosis:
A Systematic Review*

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Abstract

Objective: In psychosis, low engagement with mental health services is both prevalent and frequently associated with adverse consequences. Previous reviews conceptualized disengagement as a binary outcome, focused on the demographic or clinical correlates, and/or solely included first-episode psychosis samples. Therefore, this systematic review summarised and critically evaluated studies that explored clinical and/or psychological correlates of service engagement in a broadly defined psychosis sample.

Method: Electronic databases (i.e. Ovid MEDLINE; PsychINFO; CINAHL; EMBASE) were searched to identify eligible studies.

Results: Seventeen articles were identified, representing twelve samples comprising 2591 participants. Three primary validated measures of service engagement were identified. There was relatively robust evidence supporting the association between engagement and a variety of clinical variables, with some findings contradicting those of previous reviews. Eleven of the thirteen studied psychological variables were identified as being associated with service engagement, encompassing developmental, individual and relational factors. Assessment of quality and risk of bias revealed a number of limitations within included studies.

Conclusion: Numerous clinical and psychological variables were found to be associated with service engagement, which has the potential to inform clinical practice. Longitudinal and qualitative studies are required to disentangle how these variables interact with engagement.

Key words: psychosis; Schizophrenia; service engagement; treatment adherence; systematic review

Summations

- Numerous clinical and psychological variables were identified as correlates of service engagement in psychosis; thus providing potential targets for intervention, such as attachment-informed support.
- The majority of psychological variables were investigated in only one or two studies, highlighting that further research is required to strengthen the evidence-base.
- All but one study used clinician-rated rather than self-report measures of service engagement.

Considerations

- The vast majority of included studies were cross-sectional in design, which represents a barrier to studying engagement as a process rather than as an outcome.
- As only one included study used a self-report measure of engagement, the voice of the service user is largely not represented in the synthesised data.
- The heterogeneity of studies, measures and outcomes precluded the application of meta-analytic approaches to the data

Introduction

Low or inconsistent levels of engagement with mental health services is associated with a number of adverse outcomes for people who experience psychosis (1). Evidence suggests that people with psychosis who do not attend follow-up appointments with mental health services are more likely to be admitted to hospital than those that remain in contact (2). Further, estimates suggest that up to 25% of people with psychosis disengage from treatment programmes (1). There exists a vast body of literature reporting on trials that have investigated the efficacy of various interventions for people with psychosis, yet even the most potentially powerful interventions are only effective for those who are able or willing to engage with them. Indeed, within wider mental health research, engagement is frequently used as a process variable in intervention trials because it is recognised as having the potential to substantially influence outcome. Therefore, it is crucial to gain a comprehensive understanding of the variables that are associated with service engagement, so as to shape clinician approaches to maximise engagement. However, in order to better understand how key variables relate to service engagement, the concept requires clear operationalization, with corresponding implications for valid, reliable measures.

In 2001, Hall, Meadon, Smith and Jones described service engagement as contact with services, openness about difficulties and collaborative involvement in treatment (3). Later, O'Brien, Fahmy and Singh (4) defined the

concept of service engagement as an amalgamation of the development of the “therapeutic relationship, the acceptance of help, satisfaction with the help already received, and mutual acceptance and collaboration in working towards shared goals”. Despite these conceptualizations of service engagement as a reciprocal, dynamic and multifactorial process that may be amenable to intervention, the majority of research in the field focuses on the concepts of ‘disengagement’ or ‘drop-out’ as binary and end-state outcomes (5). Accordingly, Doyle, Turner and Fanning et al. concluded that the concept remains poorly defined within relevant literature, as very few articles explicitly state how they define service engagement (5). Further, it has been noted that many recent studies continue to use ‘medication adherence’ or ‘appointment attendance’ as proxy measures of engagement (6).

Currently, no gold standard method exists for assessing engagement with mental health services, however within the past two decades, numerous service engagement questionnaires have been developed. Three of the more prominent of such measures are the Service Engagement Measure (SEM; 3), the Service Engagement Scale (SES; 7) and the Singh-O’Brien Level of Engagement Scale (SOLES; 8). Each of these measures reflects various aspects of Hall and O’Brien’s conceptualisations of service engagement as a process rather than as an outcome. To date, there are no known validated service engagement measures that allow for direct comparison between service user and provider perspectives. Therefore, these points highlight the

challenge of developing a clinically and empirically useful tool that comprehensively captures the complex concept of service engagement.

Throughout the past three decades, numerous empirical studies have identified a variety of variables that are significantly associated with service engagement or disengagement. In their literature reviews, Kreyenbuhl, Nossel and Dixon (9) and O'Brien et al. (4) both concluded that younger age, substance use and being a member of an ethnic minority were robust correlates of lower service engagement. In addition, Kreyenbuhl et al. also found that low social functioning was consistently associated with disengagement from services, indicating that interpersonal functioning may play an important role in service engagement. Further, O'Brien et al. (4) concluded that high levels of deprivation, low insight and a forensic history were all strongly associated with disengagement from services. Various service-level variables were also reviewed, and the lack of availability of assertive outreach provision was found to predict disengagement.

Although these publications helpfully summarise key findings in the field, they are limited by their position as narrative reviews, thus they cannot comprehensively answer questions about correlates and predictors of service engagement.

In their systematic review, Nose et al. confirmed the above findings regarding the relationship between low adherence to treatment programmes and

younger age, male gender, history of substance use, poor insight and low social functioning in people with psychosis (1). Nose et al. also found that higher severity of positive symptoms correlated with non-adherence, in addition to unemployment. More recently, Doyle et al.'s systematic review on disengagement in first-episode psychosis (FEP) again echoed findings from previous reviews, in that clinical variables such as high baseline symptom severity, low insight and substance use were found to predict low engagement (5). In addition, family support and involvement emerged as a robust predictor of high engagement. Whilst Doyle et al.'s findings are applicable to FEP, it is unclear whether they are generalisable to the wider psychosis population. Doyle et al.'s review was further limited by the inclusion of studies that were based on retrospective file audits, and those with widely ranging follow-up periods and methods of defining and measuring service engagement.

Crucially, other than low social functioning, psychological variables have been largely absent from previous reviews of the correlates of service engagement. One study included in Doyle et al.'s (5) review investigated the relationship between engagement and the 'sealing over' recovery style, which involves the minimization of the significance of symptoms, and a lack of curiosity about the experience. The results indicated that the 'sealing over' recovery style was potentially more predictive of poor engagement than low insight (7). Similarly, another study from the review found that the personality traits 'low neuroticism' and 'high agreeableness' were related to poor

medication adherence (10). Further, two studies in the review explored the relationship between childhood physical abuse and service engagement. Lecomte, Spidel, Leclerc, MacEwan, Greaves & Bentall (10) found that having experienced childhood physical abuse was predictive of low engagement. However, Conus, Lambert, Cotton, Bonsack, McGorry and Schimmelmann (11) did not replicate this finding. To note, methodological differences may account for the variability in findings between these studies, as Lecomte et al. used a formal engagement measure to assess service engagement, whereas Conus et al. used retrospective file audit to identify episodes of disengagement. Taken together, preliminary evidence indicates that some psychological variables may play an important role in engagement; thus, this topic appears to merit further investigation.

None of the previous reviews summarising correlates of service engagement conducted a formal quality assessment of included studies; therefore some caution should be exercised in the interpretation of the findings. Further, all the previous reviews focused on the outcome of disengagement, rather than on the process of engagement. Finally, studies that used a validated measure of service engagement were in the minority in previous reviews, which reduces the validity of comparing findings across studies.

To conclude, existing reviews have highlighted a wide range of socio-demographic and clinical variables that appear to be related to service engagement and disengagement in people with psychosis. However, based

on these reviews and despite promising preliminary evidence, it appears that there is a dearth of studies investigating the relationship between specific psychological variables and service engagement. This is of particular interest, as some psychological variables may be amenable to intervention; thus identifying potential treatment targets to enhance service engagement in clinical settings.

Aims

The current systematic review seeks to address the limitations of prior reviews, by systematically identifying, summarising and critically evaluating studies that have investigated service engagement in psychosis. Specifically, the review aims to address the following research questions:

- Which formal measures have been used to measure service engagement?
- What is the evidence that clinical variables are associated with service engagement?
- What is the evidence that psychological variables are associated with service engagement?
- What are the methodological sources of bias in the literature?

It is acknowledged that previous reviews suggest that both demographic and service-level variables also appear to play a role in the process of service

engagement, however it was beyond the scope of the current systematic review to examine the evidence for the role of these variables. Further, the inclusion of these variables may have diluted the emphasis on psychological variables.

Method

Definitions

For the purposes of the current review, 'service engagement' is defined in accordance with O'Brien et al.'s definition (4), as stated above.

As in Doyle et al. (5), correlates and/or predictors of service engagement have been categorised as either 'clinical' or 'psychological' in an effort to increase clarity and readability, and to highlight the extant evidence for the relationship between psychological variables and service engagement. However, it is acknowledged that the division of 'clinical' and 'psychological' variables is somewhat arbitrary, as several of the variables placed in each category could arguably fit with the other. 'Clinical variables' include factors that reflect diagnostic criteria for conditions related to psychosis, such as symptomology and insight. Whereas, 'psychological variables' capture concepts that can be understood as more relevant to the person as an

individual, rather than to their diagnosis, such as personality traits and experiences of childhood abuse.

Design

A systematic review was conducted following PRISMA Guidelines (see Appendix B).

Inclusion and Exclusion Criteria

An article was included if:

- the full sample was composed of participants who met criteria for an affective or non-affective psychotic disorder, as defined by the Diagnostic Statistical Manual of Mental Disorders, 4th edition (12).
- a formal, validated measure of service engagement was utilised
- the study focused on 'engagement' with services, rather than on 'disengagement' or 'drop-out' from services
- the study investigated clinical or psychological correlates and/or predictors of service engagement
- the study was written in English

Exclusion criteria were as follows:

- studies that did not use a formal measure of service engagement
- studies that focused solely on 'disengagement' or 'drop-out' from services

- qualitative studies
- single case studies
- unpublished studies
- conference abstracts
- book chapters

Search Strategy

On the 18th of December, 2017, electronic databases were searched for relevant articles that examine service engagement in people who experience psychosis.

The following electronic databases were searched: Ovid MEDLINE (1946 - search date); EMBASE (1974 - search date); PsychINFO (1980 – search date); CINAHL (2003 – search date); Google Scholar (no specified start date – search date). The subject headings ‘Psychosis’ OR ‘Schizophrenia’ OR ‘Psychotic Disorders’ were combined using the Boolean operator ‘AND’, with the free-text terms “service engage*” OR “service disengage*”. This output was then combined using ‘AND’ with the free-text terms “correlat*” OR “predict*”. To note, for both engagement related search terms, appropriate Boolean operators were used to specify that the words should be found near to one another (e.g. “Service ADJ2 engage*”). The sensitivity of the search strategy was confirmed by examining the reference lists of relevant studies

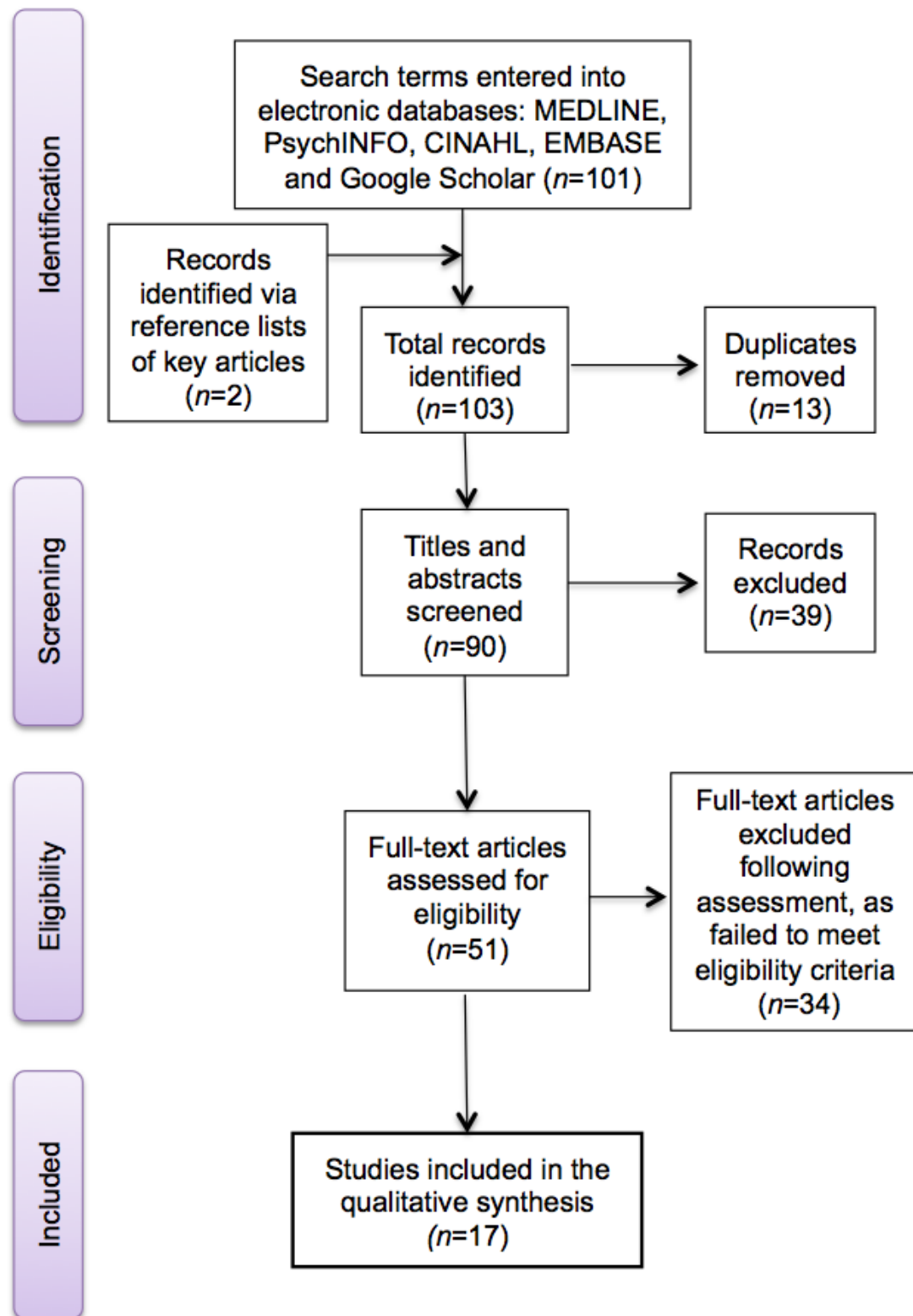
identified by the search. Duplicate articles were then removed, and the lead author screened all titles and abstracts for eligibility based on the inclusion/exclusion criteria. The screening process was repeated by an independent reviewer until 100% agreement was reached. When it was unclear whether the article met eligibility criteria, the full paper was obtained. See Figure 1 for a diagram of the search process, and Appendix C for reasons for the exclusion of each excluded full-text article.

Key authors in the field were contacted to identify potential missing or upcoming relevant articles, however no additional publications were sourced. A hand search of the reference lists of included articles and relevant journals from the past five years was also conducted. These journals included Schizophrenia Bulletin, British Journal of Psychiatry, British Journal of Clinical Psychology, Schizophrenia Research, Clinical Psychology and Psychotherapy and Acta Psychiatrica Scandinavica.

Data Extraction

A data extraction pro-forma was developed and piloted on five relevant articles and adapted accordingly in order to ensure that all key variables were captured. Effect sizes were extracted, and in some cases, they were calculated and transformed based on the reported statistics (see Appendix D).

Fig 1. PRISMA flow diagram



Quality Assessment and Risk of Bias

An assessment of quality and risk of bias was conducted using an adapted version of an Agency for Healthcare and Research Quality (AHRQ) tool (13). It was agreed by the lead author and two independent researchers that the AHRQ was an appropriate base from which the tool could be altered to more closely reflect the predominantly cross-sectional design of the included studies. Following several pilots and revisions, the final version comprised eight quality criteria (see Appendix E). The lead author assessed the quality and risk of bias of all included articles, and an independent reviewer repeated this assessment process for 10 of the 17 articles (58.82%). Initially, 59 of the 68 criteria (86.76%) across the 10 articles were assessed consistently between both reviewers. All nine rating discrepancies were only one category apart (e.g. 'well covered' vs. 'adequately covered'). Each discrepancy was discussed until 100% consensus was reached on all ratings.

Results

Study selection and characteristics

The search strategy yielded one hundred and one records. Following screening of titles and abstracts, and sixty-six full-text articles, the final total sample consisted of seventeen original research articles that met eligibility

criteria, which reported on findings from twelve discrete cohorts. See Table 1 for key characteristics of included articles. In some cases, multiple articles were derived from the same cohort (i.e. 7, 14; 10, 16, 17, 18, 19). Further, Spidel, Greaves, Yuille and Lecomte (20) reported findings yielded from two separate samples (FEP and forensic inpatient). Therefore, the remainder of the 'study selection' section will refer to the twelve discrete cohorts, rather than the seventeen publications in which they are described. The combined sample was comprised of a total of $n=2591$ participants. The mean age of participants was 31.72 years ($SD=9.39$), with men constituting 66.78% of the total sample. Samples ranged in size from $n=30$ (21) to $n=921$ (22). Publication dates ranged from 2003 (7) to 2017 (22).

Five samples were recruited in the United Kingdom, whereas the remainder were recruited in Canada ($n=3$), Italy ($n=2$), Norway ($n=1$), the Netherlands ($n=1$) and Switzerland ($n=1$). Three studies were longitudinal in design (7/14, 23, 24), whilst the remainder were cross-sectional. The follow-up periods ranged from four weeks (23) to 18 months (24). Five of the studies recruited only outpatients (22, 23, 24, 28, 29), whilst one sample was solely composed of inpatients (20), and two studies recruited from both outpatient and inpatient settings (7/14, 27). Two studies recruited participants from forensic inpatient settings (20, 21), and one study recruited both FEP and forensic inpatient samples (20). Four of the twelve samples were composed exclusively of FEP participants attending early intervention psychosis services. In terms of diagnosis, four of the twelve samples presented with

FEP, or 'Early Psychosis'. The remainder of the samples were composed of participants with a diagnosis of 'Schizophrenia or related disorders', 'Schizophrenia Spectrum Disorder', 'affective and non-affective psychosis', or those who were described as having a 'relapsing psychotic illness'. To confirm eligibility criteria regarding diagnosis, four of the studies exclusively utilised a structured clinical interview linked with a standardised diagnostic system. Four of the studies solely relied on clinician judgement, and three relied exclusively on chart review. One study used both a structured interview and chart review (23). One study did not report their method of confirming diagnosis (24).

Measurement of service engagement

Three validated measures were used to capture service engagement in the included studies. One study used the clinician-rated SEM (3), another study used the SOLES (25), whilst the remainder of studies used the SES (7).

In addition to using the clinician-rated SEM as measure of service engagement, Shah, Hull and Riley (21) used the 'University of Rhode Island Change Assessment' (URICA; 26) as a self-report proxy for service engagement. However, the URICA is focused on the concept of 'readiness for change', rather than engagement with services, and the only aspect of service engagement that it appears to address is the recognition of the need for help. Therefore, it appears that the URICA does not adequately capture

the broad concept of service engagement, and so is not considered to be a formal measure for service engagement for the purposes of the current review.

In a number of studies, service engagement measures were used in populations for which they were not validated, such as in forensic inpatient settings (20, 21). Also, almost half of the studies were conducted in countries where English is not the primary language, however only three of the articles reported making any attempt to limit the potential impact of this on comprehension, such as setting English-speaking inclusion criteria or translating measures to the appropriate language (20, 23, 27). Thus, it is possible that the validity of the measures used in the remaining studies was compromised (10, 22, 28, 29).

Table 1. Characteristics of selected articles

First author of publication (country)	Sample Size (n)	% males	Mean age (SD)	Diagnoses (screening method)	Setting	Design (follow-up period)	Engagement measure
^a Tait 2003 (UK)	50	62	33.80 (12.00)	Schizophrenia or related disorders (chart review; ICD-10)	Inpatient and home treatment	Longitudinal (3 (n=46) and 6 (n=42) months)	SES
^a Tait, 2004 (UK)	50	62	33.80 (12.00)	Schizophrenia or related disorders (chart review; ICD-10)	Inpatient and home treatment	Longitudinal (3 (n=46) and 6 (n=42) months)	SES
Lecomte, 2008 (Canada)	118	61	25.00 (5.90)	Affective/non-affective psychosis (chart review)	EIPS	Cross-sectional	SES
Shah, 2009 (UK)	30	100	36.00 (11.20)	Affective/non-affective psychosis (clinician judgement)	Forensic Inpatient	Cross-sectional	SEM
Staring, 2009 (Netherlands)	114	71	38.30 (11.50)	Schizophrenia Spectrum Disorder (CIDI-Auto 2.1)	CMHT	Cross-sectional	SES
Johansen, 2011 (Norway)	148	57	35.00 (9.80)	Schizophrenia Spectrum Disorder (SCI for DSM-IV)	Inpatient and outpatient	Cross-sectional	SES
^b MacBeth, 2011 (UK)	34	59	23.30 (7.60)	Affective/non-affective psychosis (clinician judgement; DSM-IV)	EIPS	Cross-sectional	SES
Kvrgic, 2012 (Switzerland)	127	65	44.60 (11.53)	Schizophrenia or Schizoaffective Disorder (SCI for DSM-IV-Axis 1; chart review)	CMHT	Longitudinal (4 weeks - subgroup of n=59)	SES
^b MacBeth, 2013 (UK)	64	67	23.67 (6.94)	Affective/non-affective psychosis (clinician judgement; DSM-IV)	EIPS	Cross-sectional	SES
Farrelly, 2014 (UK)	569	50.09	39.00 (N/R)	Relapsing psychotic illness (N/R)	CMHT	Longitudinal (18 months; n=N/R)	SES
^b MacBeth, 2014 (UK)	34	67	23.30 (7.60)	Affective/non-affective psychosis (clinician judgement; DSM-IV)	EIPS	Cross-sectional	SES
^b MacBeth, 2015 (UK)	64	71	23.67 (6.94)	Affective/non-affective psychosis (clinician judgement; DSM-IV)	EIPS	Cross-sectional	SES
Spidel, 2015 (Canada)	i) 117 ii) 65	64.1 93.9	i) 25.14 (6.8) ii) 37.8 (11.3)	Affective/non-affective psychosis (chart review)	EIPS and forensic inpatient	Cross-sectional	SES
Belvederi Murri, 2016 (Italy)	89	63	42.20 (10.80)	Schizophrenia (SCI for DSM-IV)	CMHT	Cross-sectional	SES
Casey, 2016 (UK)	103	71	23.00 (N/R)	First Episode Psychosis (clinician judgement)	EIPS	Cross-sectional	SOLES
^b MacBeth, 2016 (UK)	34	59	23.30 (7.60)	Affective/non-affective psychosis (clinician judgement; DSM-IV)	EIPS	Cross-sectional	SES
Rossi, 2017 (Italy)	921	70	40.14 (10.71)	Schizophrenia (SCI for DSM-IV-Patient version)	CMHT	Cross-sectional	SES

ICD-10: International Statistical Classification of Diseases and Related Health Problems - 10th Revision; CIDI-Auto 2.1: Composite International Diagnostic Interview, version 2.1; SCI for DSM-IV: Structured Clinical Interview for Diagnostic Statistical Manual of Mental Disorders, version 4; EIPS: Early intervention psychosis service; CMHT: Community Mental Health Team; N/A: not applicable; N/R: not reported; SES = Service Engagement Scale (30); SEM = Service Engagement Measure (3); SOLES = Singh O'Brien Level of Engagement Scale (8). *a* = data yielded from the same Birmingham sample; *b* = data yielded from the same Glasgow and Edinburgh sample

Clinical variables related to service engagement

The results of the studies exploring the relationships between clinical variables and service engagement are detailed in Table 2.

Six studies reported findings on the relationship between symptoms and service engagement (7, 16, 19, 20, 22, 27). All these studies used the Structured Clinical Interview for the Positive and Negative Syndrome Scale (SCI-PANSS; 31) as a method of measuring symptoms, except Spidel et al. (20), who used the Brief Psychiatric Rating Scale – Expanded (BPRS-E; 32). Also, these studies all used Tait, Birchwood and Trower's (7) Service Engagement Scale (SES) to measure engagement. Therefore, it is possible to directly compare across these studies. The findings were wide ranging, from no association (7) to significant at the 1% level with large effect sizes (16, 19).

In terms of insight, three studies reported conflicting results, as Tait et al. (7/14) found that insight did not predict service engagement, whilst Staring, Van der Gaag, Van den Berge, Duivenvoorden and Mulder (28) found lower service engagement in individuals with poor insight, with a medium effect size. Both of these studies used the same insight measure (34), yet found contradictory results. Therefore, this incongruence may be rooted in differences between sample characteristics, as Staring et al.'s sample was composed of 'moderately engaged' individuals, whereas Tait et al.'s study

sample was characterised as being in 'acute crisis', during which times engagement levels may be more variable.

Staring et al. (28) and Belvederi Murri, Amore and Calcagno et al. (29) found little to no evidence to support a relationship between depression and service engagement. However, Staring et al. used only a single item from the SCI-PANSS to measure depression, which does not constitute a comprehensive method of measuring depression.

Johansen, Hestad, Iversen et al. (27) found some evidence to support the relationship between greater cognitive difficulties and poorer service engagement. Low 'Conceptualizing' ability was found to predict low service engagement, whereas the impact of executive functioning and verbal memory appeared to be minor and negligible, respectively.

Casey et al. (25) found a small correlation between 'Duration of Untreated Psychosis', however MacBeth et al. (16) did not find a relationship between these variables. Casey et al. (25) did not find evidence of a relationship between either 'Duration of Untreated Illness' or 'Length of Prodrome' with service engagement.

Spidel et al. (20) found that higher self-rated psychopathy predicted low service engagement in their 'first-episode psychosis' sample, however no evidence of this relationship was found in their 'forensic inpatient' sample.

Table 2. Summary of evidence of relationship between clinical variables and service engagement

Clinical Variable Study (engagement measure)	Measure	Association (significance level)	Effect Size	Key Findings
Symptoms				
Tait et al., 2003 (SES)	<i>Structured Clinical Interview for the Positive and Negative Syndrome Scale (SCI-PANSS; 31)</i>	N/C (N/S)	N/A	No relationship between symptoms and service engagement.
Johansen et al., 2011 (SES)	<i>SCI-PANSS (31)</i> <ul style="list-style-type: none"> • Positive • Negative • Cognitive / Disorganized • Excitative • Emotional Distress 	$r=0.31$ (**) $r=0.25$ (*) $r=0.26$ (**) $r=0.27$ (**) $r=0.19$ (*)	M S-M S-M S-M S	Service engagement was significantly more problematic in patients with higher levels of active psychotic symptoms. PANSS positive made a significant contribution to the final regression model, and the excitative and negative components had a trend-level contribution.
MacBeth et al., 2013 (SES)	<i>SCI-PANSS (31)</i> <ul style="list-style-type: none"> • Positive • Negative • General psychopathology 	$r=0.39$ (*) $r=0.65$ (**) $r=0.34$ (*)	M L M	Low engagement was significantly correlated with greater positive and negative symptoms, as well as general psychopathology. Only negative symptoms emerged as a significant predictor of low service engagement.
Spidel et al., 2015 (SES)	<i>Brief Psychiatric Rating Scale–Expanded (BPRS-E; 32)</i> <ul style="list-style-type: none"> • First episode sample • Forensic inpatient sample 	$B=0.37$ (*) $B=0.08$ (*)	M S	Higher scores on the BPRS significantly predicted poor service engagement for both samples.
MacBeth et al., 2016 (SES)	<i>SCI-PANSS (31)</i> <ul style="list-style-type: none"> • Positive • Negative • Cognitive / Disorganized • Excitative • Emotional Distress 	$r=0.27$ (N/S) $r=0.52$ (**) $r=0.50$ (*) $r=0.24$ (N/S) $r=0.00$ (N/S)	S-M L L S Neg	More severe negative and disorganized symptoms were associated with poorer service engagement.
Rossi et al., 2017 (SES)	<i>SCI-PANSS (31)</i>	$b=0.20$ (**)	M	Higher symptom severity was strongly associated with lower service engagement.
Depression				
Staring et al., 2009 (SES)	<i>Depressed mood (item G6 of the PANSS; 31)</i>	$r=-0.22$ (*)	S	Service engagement was significantly more problematic in participants with more severe depression.
Belvederi Murri et al., 2016 (SES)	<i>Calgary Depression Scale for Schizophrenia (CDSS; 33)</i>	$r=-0.05$ (N/S)	Neg	No relationship was found between depression and engagement. However, good service engagement was found to significantly moderate the effect of insight on depression (protective effect).
Insight				
Tait et al., 2003 (SES)	<i>Insight Scale (IS; 34)</i>	$r=-0.09$ (N/S)	Neg-S	Insight did not predict engagement at 6 months.
Staring et al., 2009. (SES)	<i>Insight Scale (IS; 34)</i>	$r=-0.34$ (**)	M	Service engagement was significantly lower in patients with poorer insight.
Belvederi Murri et al., 2016 (SES)	<i>Scale to Assess Unawareness of Mental Disorder (SUMD; 35)</i>	$r=0.27$ (*)	S-M	There was a significant correlation between insight and service engagement.

Duration of Untreated Psychosis / Illness					No correlation was found between service engagement and duration of untreated psychosis.
MacBeth et al., 2013 (SES)	<i>Duration of Untreated Psychosis Interview</i> (36)	• Untreated psychosis	$r=0.20$ (N/S)	S	
Casey et al., 2016 (SOLES)	<i>The Nottingham Onset Schedule</i> (NOS; 37)	• Untreated psychosis	$r_s=0.22$ (*)	S	Greater duration of untreated illness correlated with lower engagement scores, whereas duration of untreated psychosis and length of prodrome did not.
		• Untreated illness	$r_s=0.15$ (N/S)	S	
		• Length of prodrome	$r_s=0.17$ (N/S)	S	
Psychopathic Traits					
Spidel et al., 2015 (SES)	<i>Self-report Psychopathy Scale</i> (SRP-II; 38)	• First episode sample	$B=0.22$ (*)	M	Linear regression revealed that higher self-rated psychopathy was the second strongest predictor of low service engagement, after childhood physical abuse.
	<i>Psychopathy Checklist: Screening Version</i> (PCL:SV; 40)	• Forensic inpatient sample	$B=0.11$ (N/S)	S	
Neurocognition					
Conceptualising Johansen et al., 2011 (SES)	<i>Wechsler Abbreviated Scale of Intelligence</i> (WASI; 40)	• Similarities sub-test	$r=-0.26$ (**)	S-M	Conceptualisation significantly correlated with service engagement, and was the only cognitive component that substantially influenced engagement in the regression model.
Executive Functioning Johansen et al., 2011 (SES)	<i>Delis Kaplan Executive Functioning Scale</i> (D-KEFS; 41)	<i>Verbal fluency test</i>			Letter fluency and semantic set shift measures were both significantly correlated with total SES score, whereas the other executive functioning measures did not correlate with service engagement.
		• Letter fluency	$r=-0.17$ (*)	S	
		• Semantic fluency	$r=-0.09$ (N/S)	Neg-S	
		• Semantic set shift	$r=-0.16$ (*)	S	
		<i>Color-word interference test</i>			
Verbal Memory Johansen et al., 2011 (SES)	<i>Wechsler Memory Scale</i> , (WMS-III; 42)	• Interference	$r=-0.14$ (N/S)	S	Verbal memory was not found to correlate with service engagement on either the WMS or the CVLT.
		• Interference switching	$r=0.01$ (N/S)	Neg	
	<i>California Verbal Learning Test</i> (CVLT-II; 43)				
		• Total correct	$r=-0.01$ (N/S)	Neg	
		• Delayed free recall	$r=0.06$ (N/S)	Neg	

* significant at the ≤ 0.05 level; ** significant at the ≤ 0.01 level; N/S = non-significant; N/A = non-applicable; N/C = no correlation; S = Small; M = Medium; L = Large; Neg = Negligible; r_s = Spearman Rank Correlation; β = Standardized regression coefficient; B or b = Unstandardized regression coefficient; SES = Service Engagement Scale (30); SOLES = Singh O'Brien Level of Engagement Scale (8)

Psychological variables related to service engagement

Key findings from studies that explored the relationship between service engagement and psychological variables can be found in Table 3.

The results of the review revealed that various developmental factors were significantly associated with service engagement, including premorbid adjustment, attachment and history of childhood physical abuse. Further, numerous relational factors were associated with service engagement, including psychosocial functioning, metacognition and therapeutic alliance. Finally, a range of individual factors also correlated with service engagement, including recovery style, beliefs and attributions about illness, quality of life, neurotic personality traits and knowledge of rights as a patient. The forthcoming narrative discusses findings for each variable that was investigated by more than one study; hence variables that were explored by only one study will not be expanded upon.

In regards to attachment, findings ranged from non-significant with a negligible strength of effect (23), to highly significant with a large effect size (14). It is of note that all the studies investigating the relationship between attachment and engagement used different measures of attachment (14, 15, 23); therefore, they may be tapping into different aspects of the construct. Also, the samples across the three studies are notably different, ranging from FEP (15), to chronic outpatient (23), to acute crisis (14). Further, Kvrjic,

Beck, Cavelti, Kossowsky, Stieglitz and Vauth (23) used the SES in a German-speaking country without translation or specifying that participants must be proficient in understanding and reading the English language, as noted previously. However, one key consistency between studies is that Tait et al. (14) and MacBeth et al. (15) both found that insecure attachment style was predictive of low service engagement. Further, Farrelly and Lester (24) and Lecomte et al. (10) found that a strong therapeutic alliance with care coordinators and therapists was moderately related to high service engagement.

Spidel et al. (20) and Lecomte et al.'s (10) studies both found that childhood abuse, particularly of a physical nature, was a predictor of low service engagement. However, although Spidel et al. found this relationship to be significant in their forensic inpatient sample, the effect size was negligible, and notably smaller than in their FEP sample.

Shah et al. (20) found somewhat stronger evidence than Casey, Brown, Gajwani et al. (25) in support of the relationship between service engagement and beliefs and attributions about illness. However, the studies used different measures to capture beliefs and attributions, as well as different service engagement scales. Therefore, the studies are probably too methodologically dissimilar to be directly comparable.

In terms of quality of life, MacBeth, Gumley, Schwannauer and Fisher (18) found that lower engagement with services was associated with poorer perceptions of social relationships and perceived quality of environment, but Staring et al (28) found no correlation with service engagement. However, different quality of life measures were used, which limits the comparability of the findings. Further, as highlighted by MacBeth et al. (18), there are validity concerns regarding the use of general measures of quality of life within complex mental health samples.

No evidence was found for an association between service engagement and reflective functioning (RF; 15), stigma (28) and self-esteem (28). In terms of RF, MacBeth et al.'s study (15) was limited by a modest sample size; therefore it is possible that the study was not sufficiently powered to detect a relationship. Further, Staring et al.'s study (28) excluded 'highly engaged' participants and was composed of a relatively high proportion of males; thus potentially limiting the generalisability of the findings to the wider psychosis population.

Table 3. Summary of evidence of relationship between psychological variables and service engagement

Psychological factor Article (engagement measure)	Measure	Association (significance level)	Effect Size	Key Findings
Recovery Style Tait et al., 2003 (SES)	<i>Recovery Style Questionnaire</i> (RSQ; 44) • 'Integration' groups vs. 'sealing-over' groups	$d=1.47$ (**)	L	Lower engagement was found in the 'sealing-over' group relative to the 'integration' group. Recovery style at 3 months predicted service engagement at 6 months.
Premorbid Adjustment MacBeth et al., 2013 (SES)	<i>Premorbid Adjustment Scale</i> (PAS; 45) • Social PAS • Academic PAS	$r=0.43$ (**) $r=0.27$ (N/S)	M S-M	Better overall psychosocial functioning was associated with poorer service engagement. Premorbid adjustment did not predict engagement in the regression analysis.
Psychosocial Functioning Rossi et al., 2017 (SES)	<i>Personal and Social Performance Scale</i> (PSP; 46)	$\beta = -0.27$ (**)	M	Poorer psychosocial functioning was associated with lower service engagement.
Reflective Functioning / Metacognition MacBeth et al., 2011 (SES)	<i>Adult Attachment Interview (AAI)- Reflective Function Coding Framework</i> (47)	N/C	N/A	SES total and subscales did not correlate with reflective functioning scores.
MacBeth et al., 2014 (SES)	<i>Metacognition Assessment Scale – Revised</i> (MAS-R – version 4.0; 48) • Understanding own mind • Understanding other's minds • Mastery	$r=-0.30$ (N/S) $r=-0.39$ (*) $r=-0.13$ (N/S)	M M S	Lower scores for metacognitive understanding of others' minds were significantly correlated with lower service engagement. The 'help-seeking' subscale of the SES was significantly correlated with both understanding ones' own mind ($r=-.052^{**}$) and others' minds ($r=-0.61^{**}$).
MacBeth et al., 2016 (SES)	Item-level analysis of MAS-R (48) • Understanding own mind (UM): Cognitive Identification • Understanding other's minds (UOM): Decentration	$r=0.48$ (*) $r=0.38$ (*)	M-L M	Metacognition was unrelated to overall SES scores, except that lower Cognitive and Decentration scores of metacognition were significantly correlated with lower overall service engagement. The SES help-seeking subscale correlated with the majority of items from the MAR-S.
Attachment Tait et al., 2004 (SES)	<i>Revised Adult Attachment Scale</i> (RAAS; 49) • Insecure current adult attachment style	$d=1.30$ (**)	L	Having an insecure attachment style is associated with a greater likelihood of disengaging from services.
MacBeth et al., 2011 (SES)	<i>Adult Attachment Interview</i> (AAI; 50) • Insecure current adult attachment style	$r=0.47$ (*)	M-L	Individuals with secure attachment classifications had significantly higher engagement than those with insecure-dismissing classifications.
Kvrgic et al., 2011 (SES)	<i>Psychosis Attachment Measure</i> (51) • Attachment anxiety • Attachment avoidance	$r=0.10$ (N/S) $r=-0.02$ (N/S)	S Neg	No relationship was found between total service engagement and attachment anxiety or avoidance. An anxious attachment style correlated with the 'treatment adherence' subscale of the SES ($r=0.20^*$).

Beliefs and Attributions				
Shah et al., 2009 (SEM: clinician-rated)	<i>Illness Perception Questionnaire for Schizophrenia</i> (IPQS; 52)	Range across IPQS constructs: r=0.18 → r=0.31 (all N/S)	S - M	None of the clinician-rated IPQS constructs significantly correlated with the clinician-rated SEM scores.
Shah et al., 2009 (URICA, action sub-scale: self-rated)	<i>IPQS</i> (52): <ul style="list-style-type: none">• Timeline acute/chronic• Timeline cyclical• Consequences• Treatment Control• Personal Control• Coherence• Identify (mental health)	r=0.51 (**) r=0.41 (*) r=0.35 (N/S) r=0.71 (**) r=0.23 (N/S) r=0.17 (N/S) r=0.30 (N/S)	L M M L S S M	Participants who perceived their condition to be chronic ('Acute/Chronic Timeline'), liable to relapse ('Cyclical Timeline') and treatable ('Treatment Control') were more engaged with services.
Casey et al., 2016 (SOLES)	<i>Beliefs About Causes of Mental Illness</i> (BACMI; 53) <ul style="list-style-type: none">• Social Stress (question 10)• Odd thoughts (question 9)	$r_s=0.31$ (**) $r_s=0.26$ (**)	M S-M	Beliefs that social stress and odd thoughts were important factors in mental illness were significant predictors of engagement.
Casey et al., 2016 (SOLES)	<i>Emerging Psychosis Attribution Schedule</i> (EPAS; 54) <ul style="list-style-type: none">• Individual attributions• Natural world attributions	$r_s=0.27$ (**) $r_s=-0.27$ (**)	S-M S-M	Engagement scores significantly correlated with both 'individual' and 'natural world' attributions of mental illness. However, neither were significant predictors of engagement.
Quality of Life				
Staring et al., 2009 (SES)	<i>Euro-Quality of Life</i> (EQ-5D; 55)	r=-0.05 (N/S)	Neg	No correlation was found between quality of life and service engagement.
MacBeth et al., 2015 (SES)	<i>World Health Organisation Quality of Life Brief Scale</i> (WHOQOL-BRIEF; 56) <ul style="list-style-type: none">• Physical• Psychological• Social relationship• Environmental	r=-0.28 (N/S) r=-0.26 (N/S) r=-0.33 (*) r=-0.46 (**)	S-M S-M M M-L	Poorer engagement with services was associated with poorer perceptions of social relationships and perceived quality of environment, but was not associated with physical or psychological aspects of quality of life.
Self Esteem				
Staring et al., 2009 (SES)	<i>Self-Esteem Rating Scale – Short Form</i> (SERS-SF; 57). <ul style="list-style-type: none">• Positive self-esteem• Negative self-esteem	r=0.08 (N/S) r=-0.02 (N/S)	Neg-S Neg	No correlation between service engagement and either positive or negative self-esteem was found.
Stigma				
Staring et al., 2009 (SES)	<i>Stigma Scale</i> (SS; 58) Perceived devaluation and discrimination subscale	r=-0.01 (N/S)	Neg	No correlation between service engagement and stigma was found.
History of Childhood Abuse				
Spidel et al., 2015 (SES)	<i>Childhood Trauma Questionnaire</i> (CTQ; 59) <ul style="list-style-type: none">• First episode• Forensic inpatient	$\beta=0.22$ (*) B=0.06 (*)	M Neg	Childhood physical abuse was the strongest predictor of low service engagement in the linear regression model.
Lecomte et al., 2008 (SES)	<i>Childhood Trauma Questionnaire</i> (59) <ul style="list-style-type: none">• Physical abuse sub-scale	$\beta=0.35$ (**)	M	Childhood physical abuse was the strongest predictor of low service engagement, accounting for 12% of the variance in the regression model.
Therapeutic Alliance				
Farrelly et al., 2014 (SES)	<i>Working Alliance Inventory – Short Form</i> (WAI-S; 60)	r=-0.34 (**)	M	Comparisons of the weakest and strongest clinician-rated therapeutic relationships indicate significant differences in engagement outcomes. Care coordinator ratings were not associated with engagement at 18 months.

Lecomte et al., 2008 (SES)	<i>Working Alliance Inventory</i> (WAI; 61)	$\beta=-0.28$ (**)	M	Strong alliance with therapists predicted high service engagement.
Personality Traits				
Lecomte et al., 2008 (SES)	<i>NEO Five Factor Inventory</i> (NEO-FFI; 62)			
	• Neuroticism	$\beta=-0.19$ (*)	S-M	High neuroticism and low agreeableness predicted high service engagement.
	• Agreeableness	$\beta=0.25$ (*)	M	
Knowledge of rights as a patient				
Lecomte et al., 2008 (SES)	<i>Client Assessment of Strengths Interests and Goals</i> (CASIG; 63)	$\beta=-0.21$ (*)	M	High levels of knowledge regarding patient rights predicted high service engagement.

* significant at the $\alpha=0.05$ level; ** significant at the $\alpha=0.01$ level; N/S = non-significant; N/A = non-applicable; N/C = no correlation; Neg = negligible; r_s = Spearman Rank Correlation; β = Standardized regression coefficient; B or b = Unstandardized regression coefficient; SES = Service Engagement Scale (30); SEM = Service Engagement Measure (3); URICA = Rhode Island Change Assessment (26); SOLES = Singh O'Brien Level of Engagement Scale (8)

Quality Assessment and Risk of Bias

The results of the assessment of quality and risk of bias for each study can be found in Table 4.

Whilst the quality of the studies was variable across the criteria, only 6% of the 110 total items were rated as 'not adequately covered', whereas 56% were rated as 'well covered' and 38% were rated as 'adequately covered'. Therefore, the included studies were generally of at least of adequate quality and were subject to minimal bias.

The quality assessment revealed that the most prominent risk of bias was in the domain of sample selection, however this risk was assessed as relatively minor and only two studies were rated as 'less than adequately covered' in this area (21, 25). Shah et al.'s sample was exclusively male and recruited from a forensic inpatient setting, no additional check to confirm diagnosis was

conducted, and ward staff judged whether or not participants met inclusion criteria (21). Further, nearly half of the potential participants who were approached declined to take part, indicating that the sample may be skewed towards more clinically stable and/or more engaged individuals.

Further, Shah et al.'s study (21) was rated as 'not adequately covered' in terms of their measures of service engagement, as the URICA was not validated for use in the psychosis population, and only the 'action' sub-scale was used in the analysis, so the extant validation information is not applicable. In addition, the SEM and the URICA are not validated for use in forensic settings, and the measures did not correlate with one another. Further, Shah et al.'s sample size was relatively small ($n=30$), and multiple tests of significance were conducted within correlational analyses, increasing the risk of both Type I and Type II errors. Casey et al. (25) did not report stipulating any inclusion or exclusion criteria, so the homogeneity of the sample is unclear. Further, Casey et al.'s sample was predominantly male (71%), were solely recruited from an EIPS service, were of a young mean age ($M=23$ years), and were recruited based on clinician judgement. Taken together, the findings of these studies should be interpreted with a degree of caution regarding their generalisability to the broader psychosis population.

Additional minor limitations in quality and sources of bias were identified. Eight of the seventeen articles reported samples that were exclusively composed of people in Early Intervention Psychosis Services (EIPS; 10, 15,

16, 17, 18, 19, 20, 25), which probably contributes to the relatively young mean age of the overall sample ($M=31.72$; $SD=9.39$). Further, EIPS samples may not be generalisable to people with psychosis who do not have access to these services, as the findings may potentially reflect the impact of receiving a comprehensive multi-disciplinary care package within the first two years following the development of psychotic symptomology. In addition, the majority of the total review sample was composed of men (66.78%), with one sample entirely composed of males (21). Further, the included studies appear to have been largely conducted in urban settings, therefore the findings may not be generalisable to people with psychosis who live in rural settings. In addition, two of the included studies exclusively recruited participants from inpatient forensic settings (20, 21), which again may not be representative of the wider psychosis population.

Further, the majority of studies relied on file review or clinician judgement to confirm diagnosis, whilst only five of the twelve samples were formally checked for diagnosis using a validated structured clinical interview (22, 23, 27, 28, 29), and one study did not report how they confirmed eligibility criteria or diagnosis (24). Further, some studies stipulated specific diagnostic inclusion criteria (e.g. 'Schizophrenia'; 22), whereas criteria in other studies were set much wider, such as "affective and non-affective psychosis" (e.g. 19). Therefore, the level of homogeneity within some of the more broadly characterised samples is less robust, however this is also a potential benefit,

as the findings of these studies are likely to be more representative of the wider psychosis population.

In terms of design, none of the longitudinal studies justified the length of follow-up period (7, 14, 23, 24). One article did not report missing data or the attrition rate (23), and another reported a relatively high attrition rate of 24% (24). However, Tait et al. reported relatively low attrition rates (7, 14). It is also of note that only four of the seventeen articles reported the use of a longitudinal design (7, 14, 23, 24), yet the majority of studies were investigating concepts that are likely to change over time, such as insight, symptoms and quality of life. Therefore, it could be argued that these constructs cannot be adequately measured in a cross-sectional study. Further, many of the studies were potentially underpowered given the type of analysis that was applied to the data, as only the largest studies that were offshoots of randomised trials reported a priori power calculations (22, 23, 24). Therefore, this increases the likelihood that Type I and Type II errors influenced the findings.

Table 4. Assessment of Risk of Bias

First Author (Year)	Design	Sample Selection	Description of Sample	Measure of Engagement	Measure of Associated Variable	Follow-Up	Missing Data	Sample Size	Appropriate Analysis
^a Tait (2003)	L	+	+	++	++	+	++	++	++
^a Tait (2004)	L	+	+	++	++	+	++	+	++
Lecomte (2008)	C	+	+	++	++	N/A	N/A	++	-
Shah (2009)	C	-	+	-	+	N/A	N/A	-	+
Staring (2009)	C	+	+	++	+	N/A	N/A	++	++
Johansen (2011)	C	++	+	++	++	N/A	N/A	++	+
^b MacBeth (2011)	C	+	++	++	++	N/A	N/A	+	++
Kvrgic (2012)	L	++	++	+	+	+	-	++	+
^b MacBeth (2013)	C	+	++	++	++	N/A	N/A	+	++
Farrelly (2014)	L	+	++	++	+	++	-	++	++
^b MacBeth (2014)	C	+	+	++	++	N/A	N/A	+	++
^b MacBeth (2015)	C	+	++	++	+	N/A	N/A	+	++
Spidel (2015)	C	+	+	++	++	N/A	N/A	++	+
Murri (2016)	C	++	++	++	++	N/A	N/A	+	++
Casey (2016)	C	-	++	++	++	N/A	N/A	++	++
^b MacBeth (2016)	C	+	++	++	+	N/A	N/A	+	++
Rossi (2017)	C	+	+	++	++	N/A	N/A	++	++

L = Longitudinal; C = Cross-Sectional; ++ = Well Covered; + = Adequately Covered; - = Not Adequately Covered; N/A = Not Applicable; *a* = data yielded from the same Birmingham sample; *b* = data yielded from the same Glasgow and Edinburgh sample

Discussion

The current review sought to summarise and critically evaluate the evidence for the relationship between service engagement and various clinical and psychological variables, as well as to identify the formal measures used to capture service engagement in people who experience psychosis.

Three validated measures of service engagement were identified. Evidence demonstrated that the Tait et al.'s Service Engagement Scale (30) was the most widely used measure, as it was used in all but two of the studies. Only one study used a formal, self-report measure of service engagement (25).

In regards to clinical variables, Nose et al. (1) found that higher levels of positive symptoms were related to lower levels of adherence to treatment programmes. The current review also found evidence that greater severity of positive symptoms predicted low service engagement (27). However, evidence also showed that the other categories of symptomology were similarly related to service engagement, including negative symptoms (16, 19) and cognitive disorganization symptoms (19, 27). Taken together, symptom sub-types do not appear to differentially predict levels of engagement, and instead it can be concluded that higher levels of overall symptomology appear to be related to lower levels of service engagement. This finding more closely reflects the outcome of Doyle et al.'s review in the FEP population (5), who suggested that this may be indicative of a 'bimodal'

relationship between symptom severity and service engagement. However, quantitative studies do not allow for the nature of the relationship to be disentangled and require further investigation through qualitative explorations. Further, two of the three included studies found a relationship between lower insight and lower service engagement (28, 29), which reflects conclusions from several previous reviews (1, 4, 5).

The current review revealed some limited evidence in support of associations between service engagement and other clinical variables, including depression, duration of untreated psychosis, neurocognitive deficits and psychopathy. However, all but one of the effect sizes were in the small range (except for psychopathy; 20), and each these variables were investigated by only one or two included studies, thus limiting the strength of the evidence-base.

In terms of psychological variables, the findings of the present review mirror those of Nose et al.'s review on predictors of treatment adherence (1), in that poorer social functioning was found to be associated with lower levels of service engagement. Therefore, levels of social functioning appear to be relevant to both treatment adherence, as well as the wider concept of service engagement. The current review uncovered varying strengths of evidence to support the relationships between service engagement and numerous developmental, relational and individual variables. The evidence that both childhood physical abuse and therapeutic alliance was related to

engagement was the most consistent of all the psychological variables. However, the evidence was less consistent between studies investigating attachment, beliefs and attributions of illness, and quality of life. The present review did not find evidence to support the relationship between service engagement and reflective functioning, self-esteem or perceived stigma.

To note, other than attachment and beliefs about the causes of mental health problems, the remainder of psychological variables were only studied within one or two samples, which again limits the potential to synthesise findings and thus the strength of the evidence-base.

There are several potential explanations for the discrepancies between the findings of the present review and those of prior reviews. It is important to note that Nose et al.'s systematic review (1) focused on treatment adherence rather than service engagement, whereas Doyle et al.'s review (5) included only FEP samples and focused on 'disengagement'. Further, the other two prior reviews (4, 9) were summaries of the literature rather than systematic reviews. In addition, none of these reviews formally assessed the quality of the included studies, and all of the previous reviews included studies that used medication and appointment adherence as proxy measures for service engagement. Therefore, these factors could all impact upon the outcomes of the reviews.

Strengths and limitations

The current review possesses a number of strengths, including the use of validated measures of service engagement in all included studies; thus placing the focus on engagement as a process rather than 'disengagement' or 'non-compliance' as an outcome. Also, given the broad 'psychosis' inclusion criterion, the findings are perhaps more generalizable to the wider psychosis population than findings in previous reviews. Further, it is the first review on engagement in psychosis to formally assess quality and risk of bias, and to explicitly explore the association between psychological variables and service engagement. Naturally, the current review's ability to draw robust conclusions is inherently restricted by the methodological weaknesses of the included studies. Fortunately, the quality assessment process revealed that the included studies were of reasonably high quality, carrying relatively minimal sources of bias.

However, the review has some notable limitations. First, the heterogeneity of studies, measures and outcomes precluded the use of meta-analytic approaches to the data. Also, many of the variables studied within the review are subject to fluctuation across time (e.g. symptoms; insight), therefore cross-sectional studies are unable to capture these changes and the impact that this may have on service engagement. This point reflects Perkins' (65) conclusion that service engagement is a dynamic process that changes over time and varies between individuals. Unfortunately, the vast majority of the

studies included in the review were cross-sectional in design, which limits our ability to study engagement as a process rather than an outcome, and to draw compelling conclusions regarding fluctuating variables. Therefore, the outcomes of static variables such as 'duration of untreated psychosis' and 'history of childhood abuse' can be interpreted with more confidence than those that are subject to change.

Further, for the instances where a variable was examined by two or more studies, different measures were often used between studies, which is most clearly demonstrated by the 'attachment' data (14, 15, 23). Whereas, when the same measures were used across multiple studies, methods of scoring and reporting were often inconsistent. For instance, the 'SCI-PANSS' (32) was used by five of six studies to measure symptoms of psychosis, but only two of these studies reported the findings using the same '5 factor' scoring method. Further, the majority of reported data was correlational as opposed to predictive in nature, therefore limiting the ability to infer causality.

Also, four of the twelve included samples (30.77%) were composed of participants who were within two years of developing psychosis and were receiving an intensive multi-disciplinary care package through EIPS services. Therefore, an over-representation of participants recruited from EIPS services within the review may limit generalisability of the findings to the wider psychosis population. However, in terms of the actual proportion of pooled participants across all included studies, this accounts for only

approximately 20%, which is reasonable in terms of the representativeness of the total sample.

In addition, the 'AHRQ' tool that was used to assess quality and risk of bias was altered to more closely reflect cross-sectional as opposed to longitudinal observational studies. Therefore, whilst this tool is well established in that it has been developed for and used in other healthcare research, the edited version has not.

Further, it is acknowledged that the categorisation of 'psychological' and 'clinical' variables is subjective and relatively arbitrary, however the categories were gleaned from previous reviews and relevant studies (4) and has been presented in this manner purely for the purposes of clarity.

Implications for research

In their reviews, O'Brien et al. (4) and Doyle et al. (5) both highlighted that very few articles in this field actually defined what they meant by service engagement. This point was echoed in the present review, as the included studies rarely stated how they were conceptualising service engagement. Therefore, it is unclear whether the engagement measures used in these studies were valid, in terms of whether they adequately reflected what the researchers intended to measure. Therefore, it is crucial for future articles in this field to be explicit in their definition of service engagement, and further,

that researchers agree upon a consensus definition of service engagement in order to allow for direct comparisons to be made between studies. Indeed, the benefits of establishing consensus definitions for 'at risk mental state' within the FEP population have been numerous in terms of improving empirical and clinical practice (66).

In addition, it may be useful for validation studies of the extant service engagement measures to be conducted in additional settings (e.g. forensic) and populations (e.g. inpatient), as well as for versions that have been translated to other languages.

Further, the fact that all but one of the seventeen included studies used a clinician-rated rather than a self-rated measure of service engagement highlights that research in this field rarely acknowledges service user views. This is a cause for concern, as engagement can fundamentally be understood as a relational concept, therefore it follows that multiple perspectives are required. Further, omitting the voice of the service user directly contradicts current guidance for clinical practice in psychosis, which stresses the importance of including and working collaboratively with the individual in every feasible way (66). At present, there is no validated service engagement measure that allows for direct comparison between service user and provider perspectives. Within the medication adherence literature, numerous studies have failed to find a correlation between self-report and clinician ratings (e.g. 67). This discrepancy highlights that service users and

providers may have differing, yet equally valuable views about engagement. As noted by O'Brien et al. (4), a clinician's perspective of engagement may constitute coercion in the eyes of the service user, and the patient may have valid reasons for withdrawing from services. Therefore, future research in this area should focus on the development of a validated measure that can collect and compare perspectives from both service users and providers in order to glean a fuller picture of service engagement.

Although some qualitative studies exist in this field, they appear to be heavily outweighed by quantitative studies aiming to identify patient characteristics that are associated with service engagement. However, a major limitation of quantitative studies in this area of research is that they do not capture the subtleties of the process of engagement. For example, if someone has collaboratively decided with their mental health team that they can cope without mental health services, these details are not captured using a quantitative tool. Therefore, perhaps it is time for the balance to shift towards mixed-methods and qualitative studies, to allow for a more contextual exploration of the barriers and facilitators to service engagement. Indeed, it is likely that service characteristics are also powerful in influencing service engagement, as previous evidence has indicated that they may be even more important than patient variables when investigating predictors of outpatient attendance (68, 69). The findings of the review suggest that it is important to explore the wider context beyond individual characteristics when seeking to better understand the process of service engagement. Therefore,

it is recommended that a systematic review should be conducted on qualitative studies exploring service engagement in psychosis, in order to highlight initial intervention targets for use by clinicians, as well as to point to future directions for research.

Implications for clinical practice

Based on the findings of the present review, it appears that attachment style is likely to influence service engagement. Therefore, clinical practice could be improved if teams expanded their understanding of engagement to encompass attachment, so that they are better able to recognise that people may struggle with engagement due to their attachment style. This would allow for attachment-informed approaches to be implemented to establish, maintain and/or restore therapeutic levels of engagement. For instance, individuals who display avoidant attachment behaviour may benefit from placing greater emphasis on emotions (70). More generally, interpersonal interventions could be integrated within widely used evidence-based approaches, as advocated by Gumley et al. in their 2014 systematic review on attachment in psychosis (71).

It is hoped that the present review contributes to the evidence-base demonstrating that many individual variables associated with service engagement are potentially amenable to intervention, and that mental health services will increasingly place engagement at the heart of their philosophy.

This could take the form of an increase in the adoption of approaches such as shared decision-making and person-centered care, both of which have an emerging evidence-base of efficacy in enhancing engagement outcomes (9). A new guideline from the National Institute of Clinical Excellence (NICE) focusing on the rehabilitation of people with severe and enduring mental health problems is currently in consultation stages and is due for release in 2020 (72). It is hoped that engagement will be a central theme within this document, as the document is likely to have significant influence on practice within the UK.

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* denotes that the reference was one of the 17 articles included in the systematic review

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APPENDIX A: Acta Psychiatrica Scandinavica Author Guidelines

Author Guidelines

Relevant Documents: Colour Work Agreement Form.

Acta Psychiatrica Scandinavica uses ScholarOne Manuscripts, the electronic editorial office.

The authors are requested to pay close attention to the following:

Manuscripts^{[1][2]} Consult a current issue of the Journal for style and format. The text should be in double-spacing with broad margins. Review articles/meta-analyses, clinical overview articles and original articles all follow the same concept:

- Title page:

A concise, informative title (max 15 words; abbreviations, acronyms), the authors' names, the names in English of departments and institutions to be attributed, and their city and country of location. Please also include a running title with a maximum of 50 characters (letters and spaces). Name, telephone number, e-mail address and full postal address of the corresponding author should be stated.

- Page 2:

Abstract not exceeding 200 words with the following structure: Objective, Method, Results, and Conclusion (the main part of the Abstract is devoted to Results). - Indication of 3 - 5 keywords in strict accordance with Medical Subject Headings.

For review articles/meta-analyses specifically:

Summations. Provide up to 3 significant Summations encapsulating the 'take-home messages' of the paper, and identify the main issues addressed with particular emphasis on their clinical and/or scientific significance. The Summations should be presented succinctly (1 max 2 sentences each), in tabulated form, and logically emerge from the conclusions of the paper (without repeating). However, they must not be dogmatic, raise new issues or pose further questions.

Considerations. In addition, each review article must cite up to 3 noteworthy Considerations in which authors essentially criticize the summations and include any caveats or limitations either of the review process or its conclusions.

The *Summations* and *Considerations* are placed immediately below the

Abstract/Keywords.

Introduction:

One to two pages concluded by the subtitle *Aims of the Study* (3 to 5 lines without literature references and abbreviations).

- A thorough *Material and methods* section.

It should be possible to read every article by itself. The author cannot refer to design, method and material described in previously published articles.

- *Results*.

Clear and short avoiding double documentation to tables/figures.

- Discussion:

Acta Psychiatrica Scandinavica articles do not have a conclusion section. If the authors find it necessary, they may include a concluding remark of maximum 5 lines as the final part of the Discussion.

- Acknowledgements:

Should include grants, sponsorships and other support to the study. Some authors may wish to thank other collaborators apart from the authors. It is stressed that only a very few people can be listed. It is the responsibility of the author to obtain written permission from the persons mentioned.

- Declaration of Interest:

Must be given if the study in any way involves pharmaceutical companies or other private or public enterprises. Each author must declare him/herself in general and not only in relation to the present study. If the study in any way investigates pharmaceutical compounds, the *Declaration of Interest* must contain information about by whom and which institutions the statistical analyses were performed and an e-mail address where to obtain the protocol. Clinical studies must be registered in online clinical databases. Please state date for registration and registration number.

- Tables and figures:

Must include legends. A maximum of 5 tables/figures can be included. Figures are given priority. Colour prints are welcomed, but please notice that authors must cover the additional production cost.

Systematic reviews and meta-analyses

Acta Psychiatrica Scandinavica welcomes submission of systematic reviews and meta-analyses. Such submissions must follow both the general guidelines for manuscripts outlined above as well as the guidelines provided in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement:

<http://www.prisma-statement.org/PRISMAStatement/PRISMAStatement.aspx>

Abbreviations and symbols^[1] For abbreviations and symbols use Units, Symbols and Abbreviations for Authors and Editors in Medicine Related

Sciences, Sixth Edition. Edited by D.N. Baron and M McKenzie Clarke. ISBN: 9781853156243, Paperback, April, 2008. All terms or abbreviations should be fully explained at first mention. All units should be metric. Use no Roman numerals. Abbreviations are not allowed in titles, headings and "Aims of the Study".

References^{[1][2][3]}_{SEP} Should be kept to the pertinent minimum and numbered consecutively in the order in which they appear in the text in accordance with the *Vancouver System*. Identify references in text, tables, and legends by Arabic numerals (in parentheses). References cited only in tables or figure legends should be numbered in accordance with a sequence established by the first identification of that figure or table in the text. Use the style of the examples below, which are based on Index Medicus. Abstracts cannot be used as references, unless published in an indexed scientific journal. Include manuscripts accepted, but not published; designate the abbreviated title of the journal followed by (in press). Papers published electronically, not yet hard copy publication should be identified by their DOI-number. Information from manuscripts not yet accepted should be cited in the text as personal communication. References must be verified by the authors against the original documents. Titles of journals should be abbreviated in accordance with Index Medicus. Examples:

Standard journal article: List all authors when 6 or fewer. When there are 7 or more, list only the first 3 authors and add "et al".

MAZZONCINI R, DONOGHUE K, HART J et al. Illicit substance use and its correlates in first episode psychosis. *Acta Psychiatr Scand* 2010;**121**:351-358

Chapter in book:

ISMAIL K. Unraveling the pathogenesis of the depression-diabetes link. In KATON W, MAJ, M, SATORIOUS N, eds. *Depression and diabetes*, Wiley-Blackwell, UK, 2010.

Illustrations/tables^{[1][2][3]}_{SEP} All figures/tables should clarify the text and their number be kept to a minimum and not exceed 5 in total. Avoid data overload. Details must be large enough to retain their clarity after reduction in size.

Illustrations

should be planned to fit the proportions of the printed page. Colour illustrations are welcomed. Authors must cover the production cost of colour illustrations.

Appendix B: Prisma Checklist



PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	



PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Appendix C: Table outlining reasons for exclusion of each excluded full-text article.

Study Title (Year; First Author)	Reason for Exclusion
Cognitive Behavioral Therapy and Assertive Community Treatment Reduces Days in Hospital and Delays Hospital Admission in Severe Psychotic Disorders (2016; Muller)	Did not investigate clinical or psychological correlates/predictors
A new scale (SES) to measure engagement with community mental health services (2002; Tait)	Did not investigate clinical or psychological correlates/predictors
Accommodation history and continuity of care in patients with psychosis (2005; Holmes)	No formal measure of service engagement
Are we addressing the 'right stuff' to enhance adherence in schizophrenia? Understanding the role of insight and attitudes towards medication (2011; Beck)	No full formal measure of service engagement (only medication adherence scale)
Assertive community treatment versus usual care in engaging and retaining clients with severe mental illness (1997; Henrickx)	No formal measure of service engagement
Attachment styles and affect regulation among outpatients with schizophrenia: Relationships to symptomatology and emotional distress (2013; Ponizovsky)	No formal measure of service engagement
Brief report: The development and psychometric properties of an observer-rated measure of engagement with mental health services (2001; Hall)	Did not investigate clinical or psychological correlates/predictors
Carers' and service users' experiences of early intervention in psychosis services: Implications for care partnerships (2016; Allard)	No formal measure of service engagement
Client views of engagement in the RAISE Connection Program for early psychosis recovery (2015; Lucksted)	No formal measure of service engagement; qualitative
Co-morbid personality disorder in early intervention psychosis clients is associated with greater key worker emotional involvement (2015; Fornells Ambrojo)	No formal measure of service engagement
Early intervention in psychosis service and psychiatric admissions (2008; Dodgson)	No formal measure of service engagement
Early psychosis in the inner city: A survey to inform service planning (2001; Garety)	No formal measure of service engagement
Effectiveness of integrated care including therapeutic assertive community treatment in severe schizophrenia spectrum and bipolar I disorders: the 24-month follow-up ACCESS II study (2014; Schottle)	No formal measure of service engagement; focused solely on 'disengagement'
Engaging immigrants in early psychosis treatment: A clinical challenge (2015; Ouellet-Plamondon)	No formal measure of service engagement
Evaluation of a New Zealand early intervention service for psychosis (2007; Theuma)	No formal measure of service engagement
Factors associated with timely physician follow-up after a first diagnosis of psychotic disorder (2017; Anderson)	No formal measure of service engagement
Factors influencing engagement with case managers: Perspectives of young people with a diagnosis of first episode psychosis (2015; Tindall)	No formal measure of service engagement; qualitative
First episode of psychosis - an audit of service engagement and management at 1-2 year follow-up (2001; Milner)	No formal measure of service engagement

First-episode drug-induced psychosis: A medium term follow up study reveals a high-risk group (2009; Crebbin)	Focused solely on 'disengagement'
Impact of mental health services on resilience in youth with first episode psychosis: A qualitative study (2017; Lal)	No formal measure of service engagement; qualitative
Linkage to care after first hospitalisation for psychosis (2006; Bonsack)	No reporting of service engagement outcomes in results section
The Hamburg-Model of integrated care for patients with psychosis: Part 1 rationale, treatment concept and results of the pre-study (2014; Lambert)	Written in German; no formal measure of service engagement
Outcomes post-discharge from an early intervention in psychosis service (2012; Dodgson)	No formal measure of service engagement
Outreach and Support in South London (OASIS). Outcomes of non-attenders to a service for people at high risk of psychosis: The case for a more assertive approach to assessment (2011; Green)	No formal measure of service engagement; focused entirely on 'disengagement'
Prospective analysis of premature mortality in schizophrenia in relation to health service engagement: a 7.5-year study within an epidemiologically complete, homogeneous population in rural Ireland (2003; Morgan)	No formal measure of service engagement
Psychological interventions on a specialist Early Intervention Inpatient Unit: An opportunity to engage? (2017; Reynolds)	No formal measure of service engagement
Recovery model among Chinese people with schizophrenia (2009; Ho)	No formal (or informal) measure of service engagement
Reducing the duration of untreated psychosis and its impact in the U.S.: The STEP-ED study (2014; Srihari)	Record of clinical trial registration – study not yet complete
Routine evaluation in first episode psychosis services: Feasibility and results from the MiData project (2008; Fisher)	No reporting of service engagement outcomes in results section
Service and treatment engagement of people with very late-onset schizophrenia-like psychosis (2014; Lam)	No formal measure of service engagement
Service engagement among patients with schizophrenia-spectrum disorders: Examining the role of insight and executive functioning (2016; Barglow)	Unpublished study
Supported employment outcomes of a randomized controlled trial of ACT and clubhouse models (2006; Macias)	No formal measure of service engagement
The development and validation of the SOLES, a new scale measuring engagement with mental health services in people with psychosis (2009; O'Brien)	Did not investigate clinical or psychological correlates/predictors
The effect of alcohol consumption on cost of care in severe psychotic illness: A report from the UK 700 study (2002; Laugharne)	No formal measure of service engagement

Appendix D: Effect Size - Calculation and Interpretation

Calculation

When t-tests and analyses of variance were reported without accompanying effect sizes, Cohen's *d* effect sizes were calculated using the sample size, sample means and standard deviations (Cohen, 1988).

Interpretation

For correlational designs, Pearson's correlation coefficient (*r*) and Spearman's Rank correlation coefficient (*r_s*) statistics were both interpreted using the following Cohen's (1988) rule of thumb: Small (0.1-0.3); Medium (0.3-0.5); Large (>0.5).

The magnitude of effect of Cohen's *d* effect sizes were interpreted in accordance with Cohen's (1988) rule of thumb: Small (0.2-0.5); Medium (0.5-0.8); Large (>0.8).

The magnitude of effect of Standardized (β) and unstandardized (*B*) regression coefficients were interpreted using Acock et al.'s (2014) methodology, which follows the following conventions: Small (<0.2); Medium (0.2-0.5); Large (>0.5).

Appendix E: Quality Rating Guidelines and Example of Quality Rating Record Form

Quality Rating of Engagement in Psychosis – Systematic Review

Adapted from: *Williams JW, Plassman BL, Burke J, Holsinger T, Benjamin S (2010). Preventing Alzheimer's Disease and Cognitive Decline. Evidence Report/Technology Assessment No. 193. (Prepared by the Duke evidence-based practice center under contract No. HHSA 290-2007-10066-I). Agency for Healthcare Research and Quality: Rockville, MD.*

General instructions:

- Grade each criterion as: Well/adequately/not adequately covered; not addressed; not reported
- Criteria below is written to characterise 'well covered'.
- Where item is not applicable write: N/A
- Factors to consider when making an assessment are listed under each criterion. Note that some criteria will only apply to specific types of study.
- Where a criterion only applies to a specific design, it is in italics.

1. Unbiased selection of the sample?

- Inclusion/exclusion criteria is clearly defined and includes important exclusions relevant to the research question (e.g. excluding people with a moderate intellectual disability, due to this being a potential confounding factor)
- Sample assessed for diagnosis using validated diagnostic measures (i.e. DSM-IV/DSM-V or ICD-10 criteria) (e.g. SCID)
- Sample is representative of the population of interest: People who have a diagnosis related to psychosis
- There is a reasonable balance between male and female participants (the closer to 50:50, the better – ideally under 60% for men)
- Recruitment strategy clearly and fully described

2. Adequate description of the sample?

- Is the sample well-characterized in terms of demographics...
- Consider key demographic information such as age, gender and ethnicity. Including these factors would constitute 'adequate' for this area, depending on the research question at hand.
- Information regarding education or socio-economic factors (and DUP etc. for FEP samples) would be well covered, as long as the rest of this component is thorough.

3. Validated method for measuring service engagement?

- Was the method used to measure service engagement clearly defined and described?
- Is the measure valid/reliable? Ideally, the authors would have quoted psychometric info from validation papers and potentially from current study (alpha levels), however the focus is on the actual measure itself rather than its reporting, so if authors have not reported it, please refer to original validation paper(s)

- *Longitudinal studies: test-retest & internal consistency data reported?*

4. Validated method for measuring psychological and clinical factor(s)?

- Was the method used to measure the factor(s) clearly defined and described?
- Was a valid and reliable method used to measure the factor(s)? Ideally, the authors would have quoted psychometric info from validation papers and potentially from current study (alpha levels), however the focus is on the actual measure itself rather than its reporting, so if authors have not reported it, please refer to original validation paper(s)
- *Longitudinal studies: test-retest & internal consistency data reported?*

5. Adequate follow-up period (longitudinal studies only)?

- Is the follow-up period appropriate, or it is too short/long? To answer this, consider the research question of the study – does this follow-up period adequately help to answer that question?
- A justification of the follow-up period length is preferable.

6. Missing data/drop-out (longitudinal studies only)?

- Did missing data from any group exceed 20%?
- In longitudinal studies, consider attrition over time as a form of missing data. Note that the criteria of < 20% missing data may be unrealistic over longer follow-up periods?
- If missing data is present and substantial, were steps taken to minimize bias (e.g., sensitivity analysis or imputation)?
- Attempts made to follow-up as many of original sample as possible?

7. Sample size sufficient for analyses relating to correlates/predictors of service engagement?

- Was the sample size sufficient to power the study?
- For studies with smaller sample sizes, did the authors take any statistical measures to limit the damage?
- Did the authors report conducting a power analysis or describe some other basis for determining the adequacy of sample sizes for the primary outcomes of interest to us (i.e. engagement and psychological variables)?
- Did the eventual sample size deviate by $\leq 10\%$ of the sample size suggested by the power calculation?

8. Analytic methods appropriate?

- Were the methods of analysis conducted appropriate for the type of outcome data (categorical, continuous, etc.)?
- Was the number of variables used in the analysis appropriate for the sample size? (The statistical techniques used must be appropriate to the data and take into account issues such as controlling for small sample size, clustering, rare outcomes, multiple comparison, and number of covariates for a given sample size)
- Are key variables all included in the analysis? Is there anything missing?

- If t-tests/corelations have been significant, are they then included in the analysis (e.g. regression)?
- If appropriate, have key demographic data or other important variables been included in regression analysis as covariates or potential moderators?

Quality Rating for Psychosis Systematic Review

To be used in conjunction with adapted AHRQ checklist notes

Study Name: Psychological and clinical factors associated with service engagement in people who experience psychosis: a Systematic Review.

Reviewer: Caroline Reid

Date: 02/03/18

Article: 1. Tait et al., 2003. Predicting engagement with services for psychosis: insight, symptoms and recovery style.

AHRQ Item	Descriptor	Decision (Well/adequately/ not adequately covered / not addressed / not reported/ N/A)	Notes
1	Unbiased selection of the sample?	Adequately covered	Chart diagnosis, active symptoms confirmed by PANSS. Recruitment strategy robust. Urban setting, only patients in acute crisis – sampling bias. But includes multiple or single episodes of psychosis and justifies question.
2	Adequate description of the sample?	Adequately covered	Information on age, gender split, whether living alone and duration of illness. No ethnicity, social-economic or education info.
3	Validated method for measuring service engagement?	Well covered	SES – detailed description, validated measure.
4	Validated method for measuring psychological/clinical factor(s)?	Well covered	RSQ – recovery style – cites validation paper. Insight Scale – insight – notes psychometrics=excellent PANSS scoring not blind, but independent.
5	<i>Adequate follow-up period (longitudinal studies only)?</i>	Adequately covered	3 and 6 months. Longer may have been preferable given nature of recovery. No justification for duration reported.
6	Missing data/drop-out (longitudinal studies only)?	Well covered	Attrition rates = 16% (acceptable)
7	Sufficient sample size for analyses relating to correlates/predictors of service engagement?	Well covered	n=50 - Sufficiently powered for type of analysis (one-way ANOVA; MANOVA). Power calculation not reported.
8	Analytic methods appropriate?	Well covered	Appropriate. Included completers vs. non-completers analysis.

Predicting Service Engagement in Psychosis: The Role of Symptomology, Interpersonal Functioning and Mentalizing

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See Appendix F for author guidelines

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Abstract

Objectives. Approximately 25% of people with psychosis have low levels of engagement with mental health services (Nose, Barbui & Tansella, 2003), which can represent a significant barrier to effective treatment and support. The majority of previous research investigating engagement in psychosis focused on demographic (e.g. age) and clinical (e.g. symptoms) correlates and predictors, using clinician-rated or proxy measures of engagement. However, evidence suggests that psychological variables such as interpersonal functioning may be closely associated with service engagement, which indicates that other relational concepts may also be relevant. The current study explored the associations between engagement, clinical and relational variables.

Design. Cross-sectional, self-report data was collected via measures of engagement, symptomology, interpersonal functioning and mentalizing. The Singh O'Brien Level of Engagement Scale (SOLES) was used to measure service engagement.

Methods. The sample was composed of 42 Scottish people with multiple-episode psychosis, from both community and inpatient settings. Hypotheses were tested using correlational, regression and mediation analyses.

Results. Greater cognitive/disorganization symptomology were predictive of lower service engagement. Service engagement was significantly correlated with mentalizing, however it was not associated with interpersonal

functioning. Mentalizing did not mediate the relationship between cognitive/disorganized symptomology and engagement.

Conclusions. This study provided evidence that cognitive/disorganization symptoms and mentalizing are associated with service engagement in a multiple-episode psychosis sample. Additional research is required to better understand the interplay between cognitive/disorganization symptoms and mentalizing with engagement. The value of incorporating self-report measures of service engagement is emphasised.

Practitioner Points

Positive clinical implications

- Cognitive/disorganized symptoms were found to predict lower service engagement in a psychosis sample, which may constitute an additional factor for clinicians to consider in the assessment and formulation of engagement.
- Mentalizing was found to correlate with engagement; therefore mentalizing-based interventions may also have potential to improve engagement.
- These results provide support for the potential role of social cognition interventions in enhancing engagement.

Limitations

- Cross-sectional data does not allow for determination of causal relationships, or for the detection of fluctuations in engagement over time.
- Qualitative methods were not incorporated; therefore contextual information surrounding self-report ratings of service engagement was not collected.
- The sample size is small, although sufficiently powered for correlational and regression analyses.

Introduction

Psychosis and Service Engagement

Psychosis is associated with high levels of distress for the individual and their caregivers, with potential pervasive, detrimental impacts upon multiple functional domains (Van Os, Linscott, Myrin-Germeys, Delespaul & Krennendam, 2009). Many individuals with psychosis have difficulties in effectively engaging with mental health services, with evidence indicating that up to 25% disengage from treatment programmes (Nose, Barbui & Tansella, 2003). Service engagement difficulties represent a substantial barrier to effective treatment and support, and are a risk factor for relapse and hospital admissions (Song, Biegel and Johnsen, 1998). Therefore, it is important to identify variables associated with service engagement, in view of shaping clinical practice to enhance engagement. Implicit within this is an understanding that engagement difficulties may reflect factors related to both the individual and the treatment provider.

In order to robustly identify variables that impact upon engagement and to enable measurement consistency and cross-study comparisons, a clear operationalization of the concept is required. There is currently no consensus definition of service engagement. Within the psychosis literature, engagement has historically been measured via proxy variables such as medication adherence and appointment attendance (Nose et al., 2003).

However, it is increasingly acknowledged that these methods are insufficient to capture the multi-factorial, complex nature of service engagement. Accordingly, O'Brien, Fahmy and Singh (2009) defined service engagement as a "complex phenomenon, encompassing factors that include acceptance of a need for help, the formation of a therapeutic alliance with professionals, satisfaction with the help already received and a mutual acceptance and working towards shared goals".

Three formal measures of service engagement in psychosis that each comprise several aspects of O'Brien et al.'s definition are the clinician-rated Service Engagement Measure (SEM; Hall, Smith & Jones, 2001), Service Engagement Scale (SES; Tait, Birchwood & Trower, 2002), and the patient-rated Singh O'Brien Level of Engagement Scale (SOLES; O'Brien, White, Fahmy & Singh, 2009). In this empirical field, the most widely used formal engagement measure is the clinician-rated SES (Tait et al., 2002; see Reid et al., in preparation, for review). Whilst this measure is psychometrically sound and has clinical utility, it is limited by the failure to take service users' perspectives into account. Consequently, the vast majority of the extant literature in this field of research is skewed towards service provider views; neglecting service user perspectives (O'Brien, Fahmy et al., 2009).

Correlates of Engagement

Reviews of the literature suggest that multiple socio-demographic, clinical, psychological and service-level variables are associated with and predictive of service engagement in people with complex mental health difficulties (O'Brien, Fahmy et al., 2009), first-episode psychosis (FEP; Doyle et al., 2014) and the wider psychosis population (Nose et al., 2003). The present discussion will focus on symptomatology (i.e. clinical variable), interpersonal functioning and mentalizing (i.e. psychological variables).

Symptomology

Systematic review evidence suggests inconsistent findings regarding the relationship between symptoms and disengagement (Doyle et al., 2014). For instance, Johansen et al. (2011) reported greater symptom severity associated with lower engagement with services, whereas Conus et al. (2010) found that people with milder symptoms were twice as likely to disengage. The results of the most recent systematic review in this field (Reid et al., in preparation) reported that five of the six studies found associations between greater symptom severity and lower engagement (Johansen et al., 2011; MacBeth, Gumley, Schwannauer & Fisher, 2013; Spidel, Greaves, Yuille & Lecomte, 2015; MacBeth et al., 2016; Rossi et al., 2017).

One possible explanation for these conflicting findings is the 'bimodal relationship' between symptom severity and service disengagement (Doyle et al., 2014). In this model, individuals disengage when symptoms are milder, as they do not feel the need to seek help, but equally may withdraw from services when symptoms are particularly severe. However, no evidence of a bimodal relationship was found in Reid et al.'s systematic review, as the symptomology findings were relatively consistent and unidirectional. Therefore, the conflicting findings between systematic reviews may be due to methodological and population differences. Further, Doyle et al.'s focus on 'disengagement' as a dichotomous outcome as opposed to 'engagement' as a complex process suggests that these reviews may be investigating fundamentally different, yet potentially overlapping constructs.

There are also inconsistencies between studies regarding associations between specific symptom types and service engagement. For instance, Johansen et al. (2011) found that greater positive symptoms were predictive of lower service engagement, but Macbeth et al. (2013) found that greater negative symptoms were the only significant predictive symptom of low engagement. However, there is evidence to suggest that greater positive and negative symptoms, as well as greater emotional distress, excitement and cognitive disorganization are each associated with poorer service engagement (Johansen et al. 2011; MacBeth et al., 2013), although effect sizes were variable between studies. Both Johansen et al. and MacBeth et al. (2016) reported that greater severity of cognitive/disorganized symptoms

was significantly correlated with lower service engagement. Similarly, Johansen et al. (2011) also found evidence that the cognitive skill 'conceptualizing' substantially influenced engagement in the regression model. Therefore, these studies provide preliminary evidence that greater cognitive deficits may be associated with lower service engagement in people with psychosis.

Psychological Variables

Historically, research on the correlates of service engagement in people with psychosis largely focused on demographic (e.g. gender, age), or clinical correlates (e.g. symptoms, insight) (Nose et al., 2003). However, more recently, significant associations have been found between service engagement and psychological concepts, including recovery style (Tait, Birchwood & Trower, 2003), attachment (MacBeth, Gumley, Schwannauer & Fisher, 2011), experiences of childhood abuse (Lecomte et al., 2008; Spidel et al., 2015) and beliefs about the causes of mental illness (Casey et al., 2016). As engagement is a relational process, deficits in interpersonal functioning and mentalization are theoretically likely to be related to low service engagement (O'Brien, Fahmy et al., 2009). Further, relational deficits constitute a clinical target for psychosocial intervention, unlike unalterable demographic factors such as age.

Interpersonal Functioning

Evidence suggests that individuals experiencing psychosis have significant deficits in social functioning (Penn et al., 2004). In their systematic review, Nose et al. (2003) concluded that greater deficits in social functioning were associated with lower service engagement in people with psychosis. In a FEP sample, MacBeth et al. (2013) found a significant relationship between lower engagement and poorer premorbid social adjustment. Recently, Rossi et al. (2017) determined that lower social functioning was significantly related to lower engagement, with a medium effect size. Taken together, these findings are indicative of a reasonably robust relationship between service engagement and interpersonal functioning.

Further, there appears to be a link between interpersonal functioning and negative symptomology. Meyer et al. (2014) found that negative symptom severity predicted both current (i.e. immediate) and premorbid (i.e. longstanding) interpersonal difficulties. Also, Rossi et al. (2017) found that greater overall symptom severity correlated with poorer current psychosocial functioning. Therefore, evidence suggests that interpersonal functioning is related to both service engagement and to symptom severity, however the mechanisms by which these variables interact remains unexplored.

Mentalizing

Mentalizing is a multidimensional construct signifying attempts to understand oneself and others, as driven by intentional mental states, such as beliefs, desires, emotions or intentions (Bateman & Fonagy, 2012). In addition, mentalizing has been described as the foundation of healthy relationships and self-awareness (Allen, Fonagy & Bateman, 2008). Evidence suggests that mentalizing and interpersonal functioning deficits are closely linked (Lysaker et al., 2013). In their meta-analysis, Sprong, Schothorst, Vos, Hox and Engeland (2007) found stable trait-level mentalizing deficits in people who experience psychosis, and that these deficits are related to symptom severity. Evidence indicates that people with psychosis tend to under-mentalize, which represents a deficit in the monitoring of own or others' mental states, as well as displaying a tendency to over-mentalize, which involves making faulty interpretations, often with rigid certainty (Fonagy et al., 2016).

Within the context of Mentalization-Based Treatment (Fonagy & Bateman, 2004), mentalizing is conceptualised as an ability that is acquired through interaction with responsive and sensitive parents, and therefore is likely to be impaired in the children of abusive caregivers. It is now widely recognised that the psychosis population have experienced elevated levels of childhood trauma and adversity (e.g. Schafer & Fisher, 2011), to such an extent that childhood adversity has been referred to as a substantial risk factor for

psychosis (Varese et al., 2012). However, research investigating the specific psychological mechanisms underlying these relationships remains in its infancy and is currently a priority in the empirical field (Bentall et al., 2014).

To date, MacBeth et al.'s (2011) FEP study is the only known investigation of the relationship between mentalizing and service engagement in a psychosis sample. In this study, mentalizing scores were derived using the Reflective Function (RF) coding framework (Fonagy, Target, Steele & Steele, 1998), an operationalization of mentalizing (Fonagy & Target, 2002). MacBeth et al. (2011) found that engagement was not associated with either RF or symptomology. However, it is of note that the study had a relatively modest sample size; therefore the data may not have been sufficiently powered to detect an effect. The same cohort also reported on the relationship between service engagement and 'metacognition', a construct that has substantial theoretical overlap with mentalizing (Dimaggio & Lysaker, 2015). Metacognition involves understanding one's own and others' mental states (Brune, Abdel-Hamid, Lehmkamper & Sonntag, 2007). The results showed that greater deficits in the metacognitive understanding of others' minds correlated with lower service engagement in a FEP sample (MacBeth, Gumley, Schwannauer & Fisher, 2015). The results also revealed that metacognition was significantly associated with negative symptomology.

Taken together, it appears that there is a lack of research investigating the relationship between mentalizing and service engagement in multiple-episode psychosis samples.

Hypotheses

Using a formal, patient-rated measure of service engagement with a broadly defined psychosis sample, the hypotheses for the current study were as follows:

- 1) Greater symptomology will be associated with and predictive of lower service engagement
- 2) Greater difficulties with interpersonal functioning and mentalizing will be associated with and predictive of lower service engagement
- 3) Interpersonal functioning and/or mentalizing will mediate the relationship between symptomology and service engagement

Method

Design

The study used a non-experimental, cross-sectional design. Recruitment was pooled with another study using an overlapping battery of core measures. Recruitment was conducted from July 2017 to June 2018. The study received

a favourable opinion from the South East Scotland Research Ethics Committee 01 (Lothian NHS Board; see Appendix G), the University of Edinburgh School of Health and Social Science Ethics Committee, and research management approvals from NHS Grampian and NHS Lanarkshire Research and Development departments.

Participants

Sample

Participants were 42 individuals with experience of psychosis, recruited from NHS Grampian and NHS Lanarkshire, Scotland, United Kingdom. Psychosis was defined according to the Diagnostic Statistical Manual of Mental Disorders (DSM-5) as a symptom cluster of experiences of hallucinations, delusions, disorganized thinking, grossly disorganized motor behaviour or negative symptoms (American Psychiatric Association, 2013). To ensure inclusion of potential participants who may not be engaged with mental health services, a formal psychiatric diagnosis associated with psychosis was not required for eligibility.

Inclusion Criteria:

- aged 16 years and over
- experienced more than one self-reported or clinician diagnosed episodes of psychosis
- able to speak and read fluently in the English language

Exclusion criteria:

- inability to provide informed consent at time of data collection
- diagnosis of a significant Intellectual Disability
- brain injury or dementia
- psychosis that arose solely in the context of substance use

Materials

Singh Level of Engagement Scale (SOLES) - O'Brien, White, Fahmy and Singh (2009)

The SOLES is a 16-item self-rated questionnaire designed to predict service engagement in people with psychosis, assessing two domains: i) acceptance of need for treatment and ii) perceived benefit of treatment. Participants are asked to rate the extent to which they agree with a set of statements, such as “I have benefited from mental health services”, on a scale of 0 (not at all) to 10 (entirely) (see Appendix H). Results give a total score out of 160, with higher scores representing higher service engagement. The SOLES has excellent internal consistency (Guttman’s split-half=0.89; α =0.91), good concurrent validity with other related measures and high predictive validity for appointment attendance (O’Brien, White et al., 2009). The current study reported good levels of internal consistency (α = 0.80).

Positive and Negative Syndrome Scale (PANSS) – Kay, Fliszbein & Opfer (1987)

The PANSS is a semi-structured interview measuring current symptom status. Each of the 30 items is interviewer-rated on a Likert scale from 1 (absent) to 7 (extreme). The van der Gaag (2006) five-factor scoring method was employed, as this model appears to better represent the dimensional structure of PANSS data than the original three sub-scale structure (Wallwork, Fortgang, Hashimoto, Weinberger & Dickinson, 2012). The PANSS has high internal consistency, adequate external validity and test-retest reliability (Kay et al., 1987; 1988) and good inter-rater reliability (Peralta & Cuesta, 1994). In this study, internal consistency was $\alpha=0.84$. Inter-rater reliability in the current study revealed good agreement between raters (Cohen's $\kappa=0.512$ (95% CI, 0.257 to 0.767), $p<0.00$ to $\kappa=0.674$ (95% CI, 0.553 to 0.795), $p<0.00$).

Inventory of Interpersonal Problems (IIP-32) - Barkham, Hardy & Startup (1996)

The Inventory of Interpersonal Problems is a 32-item, self-rated measure of interpersonal functioning that assesses a range of social difficulties, including aggression, poor sociability and excessive dependence on others. Participants were asked to rate how distressing they find each problem on a five-point scale, ranging from 'not at all' to 'extremely'. A total score is calculated as well as 'distancing' and 'affiliating' subscale scores (MacBeth, Schwannauer & Gumley, 2008). The 'distancing' subscale reflects difficulties

in establishing and sustaining interpersonal relationships, and the 'affiliating' subscale reflects difficulties in appropriately managing these relationships. Higher scores represent greater interpersonal problems. The IIP-32 has robust psychometric properties, including high internal consistency (0.85), adequate test–retest reliability (0.70) and good face validity (Barkham et al., 1996). In this study, internal consistency was excellent ($\alpha=0.90$).

Reflective Functioning Questionnaire (RFQ-46) – Fonagy et al. (2016)

The RFQ is a 46-item self-report measure of reflective functioning (RF), the operationalization of mentalizing (Fonagy et al., 2016). Participants responded to each item using a 6-point Likert-type scale, ranging from 1 (completely disagree) to 6 (completely agree). The RFQ-46 was developed as a brief screening measure. Genuine RF involves the recognition of the opaqueness of mental states, in addition to having the capacity to form accurate models of the mind of self and others (Badoud et al., 2018). Therefore, the measure assesses both 'Certainty' (RFQ-C) and 'Uncertainty' (RFQ-U) about mental states, where *certainty* reflects rigid conviction regarding mentalistic attributes (i.e. hypermentalizing), whilst *uncertainty* reflects the inability to accurately form models of the minds of self and others (i.e. hypomentalizing). For both constructs, higher scores reflect greater difficulties in mentalizing. The validation study of the RFQ-46 (Fonagy et al., 2016) reports a 2-dimensional model (i.e. 'Certainty' and 'Uncertainty'), although this has yet to be validated in a psychosis sample. The scale has

satisfactory internal consistency ($\alpha=0.63-0.77$) and excellent test-retest reliability ($r_s=0.75-0.84$). In the current study, internal consistency across all items was good ($\alpha=0.80$).

Demographics

Participants completed a demographic information form, including gender, ethnicity, diagnosis, medication status, occupation, educational attainment and duration of illness. Postal codes were also collected, from which Scottish Index of Multiple Deprivation (SIMD) data were derived.

Procedure

Participants were primarily recruited through mental health professionals within the NHS and third sector organisations, in addition to poster advertisement for self-referral. No participants referred themselves directly. Mental health professionals approached individuals whom they believed matched eligibility criteria and provided them with the Participant Information Sheet (see Appendix I). The researcher confirmed diagnosis by reviewing mental health records. In all instances of self-reported psychosis where there was an absence of a formal diagnosis pertaining to psychosis, mental health records stated that the individual had presented with symptoms that were consistent with an episode of psychosis, on more than one occasion. The

estimated mean duration of data collection per participant was approximately 100 minutes. Data collection sessions took place over one or more sessions in mental health outpatient clinics, inpatient facilities or participants' homes. The researcher judged whether participants had the capacity to consent to participation, and obtained written, informed consent accordingly (see Appendix J). A demographic questionnaire and the battery of measures were administered. The PANSS was audio recorded for inter-rater reliability scoring. Participants were issued with a debrief form, detailing relevant contact information in the eventuality that they experienced distress following the study. One participant contacted the researcher to express mild distress, however this was quickly resolved.

Statistical Analysis

Data were analysed using SPSS version 24. All variables were checked for normality using the Shapiro-Wilk Test and analyses of participant characteristics were conducted. Associations between normally distributed variables were investigated using Pearson correlations, t-tests and analyses of variance, whereas non-parametrically distributed data were investigated using Spearman's correlations. Post hoc differences between significant variables were investigated using Bonferroni and Tukey tests. Variables that violated assumptions of normality were transformed using natural logarithmic transformations. Multiple regression analyses were conducted using the 'enter' method to predict the value of significant correlations on service

engagement. Bootstrapping on 1000 samples was applied to all aforementioned analyses.

Parallel Multiple Mediation analysis (Hayes, 2013) was used to test the indirect effect of cognitive/disorganised symptoms (i.e. X) on level of service engagement (i.e. Y), as mediated by reflective functioning 'certainty' and 'uncertainty' (proposed mediator variables – M1 and M2). Nonparametric approaches were used to enable testing of multiple mediator models without inflating family-wise error. Data were reported as point estimates with 95% Confidence Intervals (CI's), with bootstrapping on 5000 resamples. Analyses were carried out in SPSS (Version 24) using the PROCESS Macro (Hayes, 2018). Direct effects were tested for significance. For indirect effects, bias corrected bootstrapped CI's were applied, with intervals not crossing zero indicative of significant mediation.

Power Calculations

For the regression analysis, power was computed via G*Power V3.1 (Faul, Erdfelder & Buchner, 2009) based on four predictor variables, $\alpha=0.05$ (Green, 1991; Cohen, 1992), and power=0.8 (Cohen, 1992; Tabachnick & Fidell, 2001). The predictor variables were 'Duration of Illness', 'PANSS Cognitive/Disorganization', 'RFQ-46 Certainty' and 'RFQ-46 Uncertainty'. A two-tailed approach was adopted to reduce the likelihood of a type II error. In order to determine the effect size value, previous studies that examined similar variables were identified. For the relationship between symptoms and

engagement, MacBeth et al. (2013) found correlations of between 0.39 for negative symptoms and 0.65 for positive symptoms. Based on these correlational effect sizes, an effect size of 0.3 (considered a medium effect size in multiple regression) was selected for inclusion in the calculation. This t indicated that a minimum sample size of 29 is required for the study to be adequately powered. Based on Fritz and Mackinnon's (2007) power calculations, the bias-corrected bootstrap analysis requires 54 participants to achieve 0.8 power in the large-medium condition. These figures are based on estimates of effect sizes of the a and b mediation pathways (see figure 1), yielded from MacBeth et al.'s (2013) study.

Results

Sample Characteristics and Measures

Descriptive data for demographics and measures are summarized in Table 1. The mean age of participants was 44.62 years ($SD=13.63$), with an age range of 19-78. The gender distribution was 73.80% ($n=31$) male. There were no significant differences on SOLES total between genders ($t(40)=-0.11$, $p=0.91$), diagnoses ($F(31,10)=0.59$, $p=0.87$), education level ($F(31,10)=1.41$, $p=0.29$) and employment status ($F(31,10)=2.19$, $p=0.10$).

Table 1. Summary statistics for the sample (n=42)

Variable	Descriptive Statistic	
Gender	<i>n</i> (%)	
Male	31	(73.80)
Female	11	(26.20)
Diagnosis	<i>n</i> (%)	
Schizophrenia	19	(45.24)
Schizoaffective Disorder	7	(16.67)
Bipolar Disorder	5	(11.90)
Paranoid Delusional Disorder	1	(2.38)
Psychotic Depression	1	(2.38)
*Psychosis	9	(21.43)
Setting	<i>n</i> (%)	
Outpatient	35	(83.33)
Inpatient	7	(16.67)
Medication	<i>n</i> (%)	
Taking antipsychotic medication	38	(90.48)
No antipsychotic medication	4	(9.52)
Educational Attainment	<i>n</i> (%)	
Left school before age 16 years	5	(11.90)
Left school at age 16	12	(28.57)
Left school age 17-18	5	(11.90)
Completed college course	10	(23.80)
Completed university degree	10	(23.80)
Employment	<i>n</i> (%)	
Unemployed (receiving benefits)	28	(66.67)
Unemployed (not receiving benefits)	1	(2.38)
Voluntary work	4	(9.52)
Part-time paid employment	1	(2.38)
Full-time paid employment	2	(4.76)
Student	2	(4.76)
Retired	4	(9.52)
Self-reported ethnicity	<i>n</i> (%)	
White British	41	(97.61)
Other	1	(2.38)
	<i>Mean (SD)</i>	<i>Range</i>
Duration of illness (years)	17.02 (12.98)	0-45
SOLES Total Score	123.31 (21.12)	0-160
SOLES Need for Treatment	98.12 (18.49)	0-120
SOLES Benefit of Treatment	63.40 (10.93)	0-80
PANSS Positive	14.19 (4.78)	6-42
PANSS Negative	11.74 (5.19)	7-49
PANSS Cognitive/Disorganization	14.93 (5.14)	7-49
PANSS Excitement	5.12 (1.88)	4-20
PANSS Emotional Distress	11.29 (4.47)	5-35
IIP-32 Total Score	47.95 (21.40)	0-126
IIP-32 Affiliating	27.88 (12.47)	0-68
IIP-32 Distancing	20.07 (11.11)	0-64
RFQ-46 Certainty	7.17 (5.43)	0-34
RFQ-46 Uncertainty	10.98 (7.29)	0-34

Note. *Participants who reported 'psychosis' had experienced at least one episode of psychosis in their life, but did not report currently having a formal diagnosis related to psychosis. SOLES: Singh O'Brien Level of Engagement Scale (O'Brien, White et al., 2009); PANSS: Positive and Negative Syndrome Scale (Kay et al., 1987); IIP-32: Inventory of Interpersonal Functioning (Barkham, Hardy & Startup, 1996); RFQ-46: Reflective Functioning Questionnaire (Fonagy et al., 2016).

Correlational Analyses

Correlates of Service Engagement

Table 2 displays correlations between service engagement and the independent variables. Duration of illness was the only demographic variable that correlated significantly with the SOLES total score ($r_s=0.34$; $p=0.03$) and SOLES Need for Treatment subscale ($r_s=0.35$; $p=0.02$), however it did not correlate with the SOLES Benefit of Treatment subscale ($r_s=0.12$; $p=0.45$).

Individuals with greater symptoms of cognitive disorganization reported significantly poorer engagement scores in terms of the 'Need for Treatment' ($r_s=-0.33$; $p=0.04$) and 'Benefit of Treatment' ($r_s=-0.35$; $p=0.03$) subscales, although it did not significantly correlate with the SOLES total score ($r_s=-0.31$; $p=0.05$). Service engagement was unrelated to positive and negative symptoms, excitement and emotional distress.

The RFQ Certainty scale correlated significantly with the SOLES total score and subscales (range $r=-0.32$ to $r_s=-0.35$; all $p<0.05$). The RFQ Uncertainty scale correlated significantly with the SOLES total score ($r=0.35$, $p=0.02$) and the SOLES Need for Treatment subscale ($r=0.38$, $p=0.01$), but not with the Benefit of Treatment subscale ($r_s=0.25$, $p=0.11$). Service engagement was unrelated to interpersonal functioning (see Table 2).

Table 2. Correlates of Service Engagement

Variable	SOLES Total ^a	SOLES Need for Treatment ^a	SOLES Benefit of Treatment ^b
Age ^a	0.14	0.16	0.24
Duration of Illness ^b	0.34*	0.36*	0.12
SIMD Rank ^b	0.06	0.06	0.11
PANSS Positive ^a	-0.12	-0.10	0.19
PANSS Negative ^b	-0.22	-0.22	-0.19
PANSS Cognitive/Disorganization ^b	-0.31	-0.33*	-0.35*
PANSS Excitement ^b	-0.12	-0.10	-0.25
PANSS Emotional Distress ^a	0.11	0.15	0.02
IIP-32 Total ^a	0.20	0.23	0.23
IIP-32 Affiliating ^a	0.26	0.28	0.26
IIP-32 Distancing ^a	0.10	0.13	0.10
RFQ-46 Certainty ^a	-0.32*	-0.32*	-0.35*
RFQ-46 Uncertainty ^a	0.35*	0.38*	0.25

Note. * $p < 0.05$ (two tailed); SIMD: Scottish Index of Multiple Deprivation; SOLES: Singh O'Brien Level of Engagement Scale (O'Brien, White et al., 2009); PANSS: Positive and Negative Syndrome Scale (Kay et al., 1987); IIP-32: Inventory of Interpersonal Functioning (Barkham, Hardy & Startup, 1996); RFQ-46: Reflective Functioning Questionnaire (Fonagy et al., 2016)

^a normally distributed variable; ^b variable violated assumptions of normality; Spearman's Correlation Coefficient (r_s) is reported when one or both of the variables was not normally distributed; if both normally distributed, Pearson's Correlation Coefficient (r) is reported.

Correlations between independent variables

Table 3 displays correlations between the independent variables. As expected, duration of illness and age significantly correlated with one another ($r_s=0.37$, $p=0.02$). Greater age was also significantly correlated with higher scores on the RFQ Uncertainty scale ($r=0.38$, $p=0.02$).

Greater levels of deprivation (i.e. lower SIMD rank) were significantly correlated with lower self-reported difficulties with interpersonal functioning for the 'affiliating' subscale ($r_s=0.35$, $p=0.03$), but not the total score or 'distancing' subscale.

Greater symptoms of emotional distress were positively correlated with all interpersonal functioning scales (range $r=0.42$ to $r=0.52$ to, all $p<0.01$).

No other variables were significantly correlated with one another.

Table 3. Correlations between independent variables

	<i>Variable</i>	<i>1^a</i>	<i>2^b</i>	<i>3^b</i>	<i>4^a</i>	<i>5^b</i>	<i>6^b</i>	<i>7^b</i>	<i>8^a</i>	<i>9^a</i>	<i>10^a</i>	<i>11^a</i>	<i>12^a</i>	<i>13^a</i>
1	Age^a	-	0.37*	0.08	-0.01	-0.17	0.17	0.17	-0.16	0.20	0.20	0.16	0.11	0.38*
2	Duration of Illness^b	0.37*	-	0.16	0.05	0.09	0.15	0.22	0.52	0.11	0.14	0.05	-0.08	0.26
3	SIMD Rank^b	0.08	0.16	-	-0.27	-0.06	-0.27	-0.12	0.04	0.23	0.35*	0.04	-0.21	0.05
4	PANSS Positive^a	-0.01	0.05	-0.27	-	0.21	0.54**	0.44**	0.41**	0.14	0.14	0.11	0.03	-0.03
5	PANSS Negative^b	-0.17	0.09	-0.06	0.21	-	0.26	0.04	0.54**	0.26	0.26	0.23	0.01	-0.06
6	PANSS Cog Dis^b	0.17	0.15	-0.27	0.54**	0.26	-	0.51**	0.17	0.10	0.16	0.02	0.21	0.03
7	PANSS Excitement^b	0.17	0.22	-0.12	0.44**	0.04	0.51**	-	0.18	0.17	0.14	0.18	-0.02	0.20
8	PANSS Emo Dis^a	-0.16	0.52	0.04	0.41**	0.54**	0.17	0.18	-	0.52**	0.52**	0.42**	-0.24	0.03
9	IIP-32 Total^a	0.20	0.11	0.23	0.14	0.26	0.10	0.17	0.52**	-	0.92**	0.90**	-0.28	0.07
10	IIP-32 Affiliating^a	0.20	0.14	0.35*	0.14	0.26	0.16	0.14	0.52**	0.92**	-	0.65**	-0.24	.09
11	IIP-32 Distancing^a	0.16	0.05	0.04	0.11	0.23	0.02	0.18	0.42**	0.90**	0.65**	-	-0.27	0.04
12	RFQ-46 Certainty^a	0.11	-0.08	-0.21	0.03	0.01	0.21	-0.02	-0.24	-0.28	0.24	0.27	-	-0.20
13	RFQ-46 Uncertainty^a	.38*	0.26	0.05	-0.03	-0.06	0.03	0.20	0.03	0.07	0.09	0.04	-0.20	-

Note. * $p < 0.05$; ** $p < 0.01$ (two tailed); SIMD: Scottish Index of Multiple Deprivation; PANSS: Positive and Negative Syndrome Scale (Kay et al., 1987); PANSS Cog Dis: PANSS Cognitive Disorganization subscale; PANSS Emo Dis = PANSS Emotional Distress subscale; IIP-32: Inventory of Interpersonal Functioning (Barkham, Hardy & Startup, 1996); RFQ-46: Reflective Functioning Questionnaire (Fonagy et al., 2016).

^a normally distributed variable; ^b variable violated assumptions of normality; Spearman's Correlation Coefficient (r_s) is reported when one or both variables were not normally distributed; if both normally distributed, Pearson's Correlation Coefficient (r) is reported.

Regression Analysis

A multiple regression was conducted to predict engagement scores from the significant correlates of the SOLES (duration of illness, PANSS Cognitive/Disorganization and Reflective Functioning 'Certainty' (RFQ-C) and 'Uncertainty' (RFQ-U) scales). The multiple regression model significantly predicted service engagement, with a large effect size ($F(5, 36)=6.40$, $p<0.00$, $\text{adj.}R^2=0.40$). Only duration of illness and PANSS cognitive/disorganization symptoms were significant predictors, $p<0.05$. Regression coefficients, standard errors and probability values can be found in Table 4.

Table 4. Multiple regression predicting service engagement (SOLES)

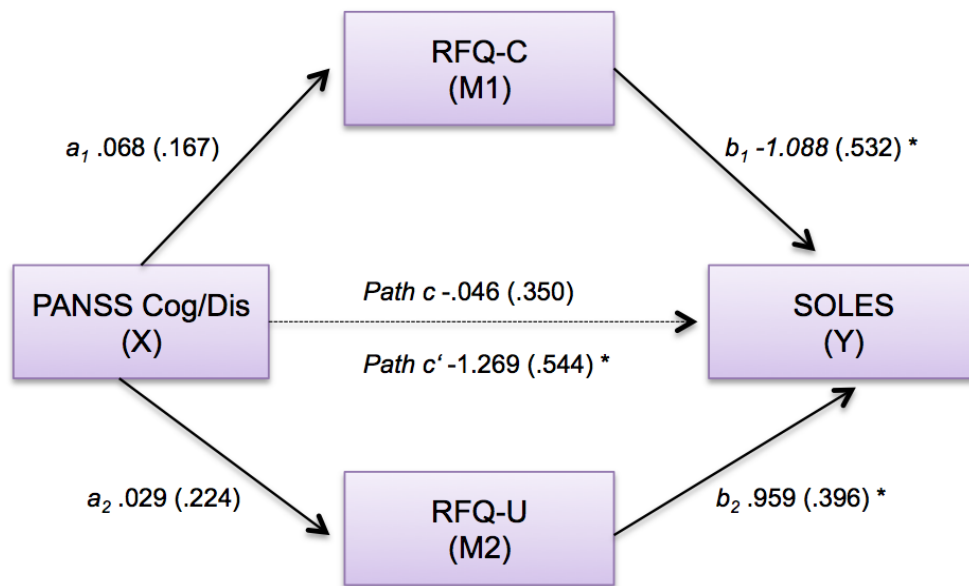
Variable	<i>B</i>	<i>SE_B</i>	β	<i>p</i>
Intercept	183.64	21.40		0.00
Duration of Illness	0.60	0.22	0.37	0.02*
PANSS Cognitive/Disorganization	-41.11	19.36	-0.28	0.04*
RFQ-46 Certainty	-0.87	0.51	-0.23	0.11
RFQ-46 Uncertainty	0.67	0.40	0.23	0.10

Note. *B* = unstandardized regression coefficient; *SE_B* = standard error of the coefficient; β = standardized coefficient; *p* = significance value; * = $p<0.05$; SOLES: Singh O'Brien Level of Engagement Scale (O'Brien, White et al., 2009); PANSS: Positive and Negative Syndrome Scale (Kay et al., 1987); RFQ-46: Reflective Functioning Questionnaire (Fonagy et al., 2016).

Mediation Analysis

The results of the parallel multiple mediation analyses are displayed in Figure 1. Whilst the total direct effect of PANSS Cognitive/Disorganization (cognitive difficulties) on SOLES (service engagement) was significant, the total indirect effect was not. Therefore, the significant relationship between cognitive/disorganization symptoms and service engagement was not mediated through either of the proposed mediators (RFQ Certainty and Uncertainty). The overall model accounted for 33.60% of the variance in service engagement total score ($R^2=0.34$, $F(3,38)=6.40$, $p=0.00$).

Figure 1. Illustrated model of multiple parallel mediation analysis



Note. $*p<0.05$. Paths a_1 and a_2 represent the direct effect of cognitive/disorganised symptoms (X) on the mediators (M1 and M2), and Paths b_1 and b_2 demonstrate the effect of the mediators on service engagement (Y), with the predictor (X) held constant. Path c is the direct effect without mediators. Path c' is the direct effect of cognitive/disorganised symptoms (X) on service engagement (Y), controlling for the variance accounted for by the mediators. The numbers following the paths are the regression coefficients, and the numbers in brackets are the standard errors for each coefficient.

Discussion

The current study investigated correlates and predictors of service engagement in a multiple-episode psychosis sample. The study sought to explore the association between service engagement and mentalizing ability, which has previously only been investigated in a FEP sample (MacBeth et al., 2011). The study also aimed to build upon prior evidence that symptomology and interpersonal functioning are associated with service engagement (Nose et al., 2003).

There was some support for the first hypothesis that greater symptomology would associate with lower service engagement, as greater cognitive/disorganization symptoms significantly correlated with lower service engagement for both SOLES subscales. This relationship was not significant for SOLES total score, however it demonstrated a medium effect size. This finding was consistent with two previous studies, which found that cognitive/disorganization symptoms significantly correlated with service engagement (Johansen et al., 2011; MacBeth et al., 2016). Other than 'duration of illness', cognitive/disorganization symptomology was the only variable that predicted service engagement in the regression model.

Therefore, the results indicate that cognitive difficulties are related to service engagement, which builds upon Johansen et al.'s (2011) findings that engagement was predicted by 'conceptualizing' ability, as measured by the

Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 2007). However, Johansen et al. found that PANSS cognitive/disorganization symptoms were correlated with but not predictive of service engagement, whereas positive, negative and excitative symptoms were all found to be predictive. It is possible that the cognitive/disorganization variable failed to emerge as a significant predictor in Johansen et al.'s study because their sample had relatively low mean PANSS cognitive/disorganization scores ($M=11.00$; $SD=3.80$) compared to the current study ($M=14.93$; $SD=5.14$). To note, despite the relatively older mean age of the current sample, there was no relationship between age and cognitive/disorganization symptoms.

Interpersonal functioning was not associated with service engagement, thus this part of the second hypothesis was not supported by the findings. This result is inconsistent with the conclusions of Nose et al.'s (2003) systematic review, and MacBeth et al.'s (2013) findings that premorbid social adjustment was correlated with engagement in a FEP sample. However, premorbid functioning represents previous rather than current interpersonal functioning, which given the relative chronicity of the current sample, may explain the difference in findings. Rossi et al. (2017) also found that psychosocial functioning was significantly correlated with service engagement. However, Rossi et al. used a different measure of interpersonal functioning (Personal and Social Performance Scale; Morosini Magliano, Brambilla, Ugolini & Piolo, 2000), and like MacBeth et al., they used the clinician-rated SES (Tait et al., 2003). Further, both MacBeth et al. and Rossi et al.'s sample sizes were

notably larger than that of the current study. Therefore, it is possible that these inconsistencies between findings are attributable to differences in measures and statistical power between studies.

Mentalizing was significantly correlated with, but not predictive of service engagement. This lends partial support to the second hypothesis. Again, the relatively small sample size may have prevented the RFQ scales from making a significant contribution to the regression model. Results showed that lower engagement scores were correlated with higher RFQ Certainty scores (i.e. poor acknowledgement of the opaqueness of mental states; 'hyper-mentalizing'). Therefore, lower service engagement was related to poorer mentalizing. Whereas for the RFQ Uncertainty scale, the results demonstrated that high engagement significantly correlated with high RFQ Uncertainty scores (i.e. greater uncertainty of attributions regarding mental states; 'hypo-mentalizing'); thus higher engagement was related to poorer mentalizing. Therefore, the direction and precise nature of the relationship between mentalizing and service engagement remains unclear; highlighting the need for further research. The RFQ Certainty and Uncertainty results contradict MacBeth et al. (2011), who found no relationship between mentalizing and engagement. However, this disparity may be rooted in the use of different samples and measures of mentalizing and service engagement.

Mediation analysis revealed that the relationship between symptoms and service engagement was not mediated by mentalizing (i.e. RFQ Certainty and Uncertainty); therefore the third hypothesis was not supported. Interpersonal functioning was not included in the mediation analysis, as it did not significantly correlate with service engagement. It is possible that the study was underpowered to detect these effects.

Another notable finding from the current study was that greater duration of illness both significantly correlated with and predicted higher service engagement, to an even greater extent than cognitive/disorganization symptomology. However, age was not associated with engagement. Therefore, these findings suggest that people who have been involved with mental health services for longer are likely to be more engaged than those that are new to services, regardless of age of onset.

Limitations

There are a number of limitations to the study's findings. In terms of selection bias, some clinicians may have only approached patients who they considered to be clinically stable and/or 'psychologically minded'. All individuals in the sample were partially engaged with mental health services, so those who were not in contact with services are not represented. However, mean SOLES scores in this sample ($M=123.31/160$) are almost identical to those in Casey et al. (2016; $M=122.61/160$). Further, the reasons

why eligible individuals declined to participate were not recorded, so it is not possible to compare individuals who participated with those who declined. In addition, the proportion of males within the sample was higher than other similar studies (see Reid et al., in preparation). However, a larger proportion of males compared to females more closely represents the gender balance in the psychosis population within mental health services in the United Kingdom (Kirkbride et al., 2012).

Diagnostic homogeneity within the sample was reduced by the inclusion of 'psychosis' in the eligibility criteria, rather than a diagnostic category such as 'Schizophrenia'. However, this also means that the results of the study are applicable to a broader psychosis population. Further, whilst mental health records were checked to confirm reports of psychosis and/or diagnoses, the other eligibility criteria were screened by referring clinicians and were not independently checked by the researcher.

Engagement has been described as a 'push-pull' process that changes over time (Tindall, Francey & Hamilton, 2015), therefore the cross-sectional design of the current study is unable to capture these fluctuations, and prevents causal inference. It is of note that some people who indicate low levels of engagement on the SOLES may genuinely be able to cope well independently. Therefore, the context surrounding 'low engagement' ratings remains unaddressed, which highlights a limitation of using questionnaires to measure engagement. Further, service engagement is fundamentally

relational, so to only gather one perspective biases the findings. Thus, there is a need for qualitative methods to be utilized within engagement studies. Finally, although sufficiently powered for correlational and regression analyses, the sample size was modest, so the possibility of Type I and II errors cannot be eliminated.

Clinical Implications

The findings of the current study are relevant to clinical practice in mental health settings. For instance, an increased awareness as to the relationship between greater cognitive/disorganization symptoms and lower engagement may allow clinicians to identify individuals who experience these difficulties. Once identified, clinicians could then use additional evidence-based strategies to maximise engagement with these individuals (e.g. focus on strengths and interests; British Psychological Society, 2014). Depending on resource availability, these individuals could be offered a psychological intervention such as Social Cognition and Interaction Training (SCIT; Roberts, Penn & Combs, 2016) in an attempt to proactively mitigate the impact of the social aspects of cognition on engagement. Similarly, given the finding that mentalizing is associated with engagement, this provides further evidence that mentalization-based approaches could be beneficial for people with psychosis. This could take the form of individual or group Mentalization-Based Treatment (Fonagy & Bateman, 2004) or the use of mentalization-

informed approaches as part of routine clinical practice (Allen, Fonagy & Bateman, 2008).

Future Directions

Future studies could adopt longitudinal designs in order to capture engagement fluctuations. Also, the context surrounding these fluctuations could be uncovered via qualitative methods with both service users and providers, either as stand-alone projects or as an adjunct to quantitative methods. Longitudinal, mixed method approaches to studying service engagement in people with multiple-episode psychosis would increase the validity of findings and may reveal additional individual and service level predictors of engagement. Further, a formal measure of service engagement could be developed to capture both service user and provider perspectives, which may constitute a more robust quantitative approach to capturing engagement, both in research and for use in clinical practice. It would also benefit future studies to explicitly define service engagement, enabling development of consensus and comparative validity.

This is the first known study to demonstrate a relationship between service engagement and mentalizing ability in people with multiple-episode psychosis. However, the RFQ was designed as a screening measure, which potentially limits the conclusions that can be drawn. Therefore, the relationship between mentalizing and service engagement merits further

investigation using validated measures to capture different facets of mentalizing and/or the process of mentalizing as it unfolds in social situations (i.e. 'online' mentalizing) (Luyten, Fonagy, Lowyck & Vermote, 2012). Similarly, the finding that greater cognitive/disorganization symptoms predicted lower engagement may provide a basis for investigation of the specific cognitive functions that drive the association between cognitive deficits and engagement. Finally, it would be interesting to explore the relationship between engagement and other aspects of social cognition, such as common cognitive biases within the psychosis population. For instance, it is possible that the 'jumping to conclusions' data gathering bias and the RFQ Certainty scale may reflect common underlying cognitive processes, such as a tendency to draw firm conclusions based on limited information (van Dael et al., 2005).

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Appendix F: British Journal of Clinical Psychology Author Guidelines

The British Journal of Clinical Psychology publishes original contributions to scientific knowledge in clinical psychology. This includes descriptive comparisons, as well as studies of the assessment, aetiology and treatment of people with a wide range of psychological problems in all age groups and settings. The level of analysis of studies ranges from biological influences on individual behaviour through to studies of psychological interventions and treatments on individuals, dyads, families and groups, to investigations of the relationships between explicitly social and psychological levels of analysis.

All papers published in The British Journal of Clinical Psychology are eligible for Panel A: Psychology, Psychiatry and Neuroscience in the Research Excellence Framework (REF).

The following types of paper are invited:

- Papers reporting original empirical investigations
- Theoretical papers, provided that these are sufficiently related to the empirical data
- Review articles which need not be exhaustive but which should give an interpretation of the state of the research in a given field and, where appropriate, identify its clinical implications
- Brief reports and comments

1. Circulation

The circulation of the Journal is worldwide. Papers are invited and encouraged from authors throughout the world.

2. Length

The word limit for papers submitted for consideration to BJCP is 5000 words and any papers that are over this word limit will be returned to the authors. The word limit does not include the abstract, reference list, figures, or tables. Appendices however are included in the word limit. The Editors retain discretion to publish papers beyond this length in cases where the clear and concise expression of the scientific content requires greater length. In such a case, the authors should contact the Editors before submission of the paper.

3. Manuscript requirements

- Contributions must be typed in double spacing with wide margins. All sheets must be numbered.

- Manuscripts should be preceded by a title page which includes a full list of authors and their affiliations, as well as the corresponding author's contact details. You may like to use this template. When entering the author names into Editorial Manager, the corresponding author will be asked to provide a CRediT contributor role to classify the role that each author played in creating the manuscript. Please see the Project CRediT website for a list of roles.
- The main document must be anonymous. Please do not mention the authors' names or affiliations (including in the Method section) and refer to any previous work in the third person.
- Tables should be typed in double spacing, each on a separate page with a self-explanatory title. Tables should be comprehensible without reference to the text. They should be placed at the end of the manuscript but they must be mentioned in the text.
- Figures can be included at the end of the document or attached as separate files, carefully labelled in initial capital/lower case lettering with symbols in a form consistent with text use. Unnecessary background patterns, lines and shading should be avoided. Captions should be listed on a separate sheet. The resolution of digital images must be at least 300 dpi. All figures must be mentioned in the text.
- All papers must include a structured abstract of up to 250 words under the headings: Objectives, Methods, Results, Conclusions. Articles which report original scientific research should also include a heading 'Design' before 'Methods'. The 'Methods' section for systematic reviews and theoretical papers should include, as a minimum, a description of the methods the author(s) used to access the literature they drew upon. That is, the abstract should summarize the databases that were consulted and the search terms that were used.
- All Articles must include Practitioner Points – these are 2–4 bullet points to detail the positive clinical implications of the work, with a further 2–4 bullet points outlining cautions or limitations of the study. They should be placed below the abstract, with the heading 'Practitioner Points'.
- For reference citations, please use APA style. Particular care should be taken to ensure that references are accurate and complete. Give all journal titles in full and provide DOI numbers where possible for journal articles.
- SI units must be used for all measurements, rounded off to practical values if appropriate, with the imperial equivalent in parentheses.
- In normal circumstances, effect size should be incorporated.
- Authors are requested to avoid the use of sexist language.
- Authors are responsible for acquiring written permission to publish lengthy quotations, illustrations, etc. for which they do not own copyright. For guidelines on editorial style, please consult the APA Publication Manual published by the American Psychological Association.

Appendix G: Evidence of Favourable Ethical Opinion from the Research Ethics Committee

Lothian NHS Board

South East Scotland Research Ethics Committee 01



Waverley Gate
2-4 Waterloo Place
Edinburgh
EH1 3EG
Telephone 0131 536 9000

www.nhslothian.scot.nhs.uk

31 March 2017

Your Ref
Our Ref

Miss Caroline Reid
Trainee Clinical Psychologist
NHS Grampian
Older Adult Psychology Service
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

Enquiries to: Sandra Wyllie
Extension: 35473
Direct Line: 0131 465 5473
Email: Sandra.Wyllie@nhslothian.scot.nhs.uk

Dear Miss Reid

Study title: **How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?**

REC reference: 17/SS/0033
IRAS project ID: 222947

Thank you for your letter of 24 March 2017, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact hra.studyregistration@nhs.net outlining the reasons for your request.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

- It is noted that Point 4, from our Provisional Opinion letter, regarding the Clinician Referral Form appears not to have been addressed; "are there any known risks associated with home visits? If so, please detail below" without providing space to do so. This should be amended and a revised form submitted.

You should notify the REC once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Revised documents should be submitted to the REC electronically from IRAS. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which you can make available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for NHS permission for research is available in the Integrated Research Application System, www.hra.nhs.uk or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Copies of advertisement materials for research participants [Poster]	1.1	24 March 2017
GP/consultant information sheets or letters [GP letter]	1	16 February 2017
Other [Debrief form]	1	16 February 2017
Other [CV - Helen Griffiths]	1	16 February 2017
Other [Clinician referral form]	1	16 February 2017
Other [brune et al 2016 paper using mentalizing measure]	1	22 February 2017
Other [Demographic information]	1.1	24 March 2017
Other [Debrief form]	1.1	24 March 2017
Other [Covering letter to REC]	1	24 March 2017
Other [GCP certificate Caroline Reid]	1	24 March 2017
Other [GCP certificate Julia Hannon]	1	24 March 2017
Participant consent form [Consent form]	1	16 February 2017
Participant information sheet (PIS) [PIS]	1.1	24 March 2017
REC Application Form [REC_Form_17022017]		17 February 2017
Research protocol or project proposal [Protocol]	1.1	24 March 2017
Summary CV for Chief Investigator (CI) [CV - Julia Hannon]	1	16 February 2017
Summary CV for student [CV - Caroline Reid]	1	16 February 2017
Summary CV for supervisor (student research) [CV - Angus MacBeth]	1	16 February 2017
Validated questionnaire [Childhood Trauma Questionnaire]	1	22 February 2017
Validated questionnaire [Impact of Events Scale]	1	22 February 2017
Validated questionnaire [Inventory of interpersonal problems]	1	22 February 2017
Validated questionnaire [Positive and negative symptoms scale]	1	22 February 2017
Validated questionnaire [The Singh O'Brien Level of Engagement Scale]	1	22 February 2017
Validated questionnaire [cartoon based mentalization measure - instructions]		22 February 2017
Validated questionnaire [sample picture task 1 - mentalizing measure]		22 February 2017
Validated questionnaire [clinical interview - positive and negative symptoms scale]		22 February 2017

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research

Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>

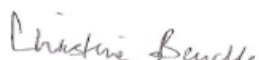
HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

17/SS/0033	Please quote this number on all correspondence
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With the Committee's best wishes for the success of this project.

Yours sincerely



Mrs Christine Beadle
Vice Chair

Email: sandra.wyllie@nhslothian.scot.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

Copy to: Ms Charlotte Smith
Ms Rebecca Whiting, NHS Grampian

Lothian NHS Board

South East Scotland Research Ethics Committee 01



Waverley Gate
2-4 Waterloo Place
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EH1 3EG
Telephone 0131 536 9000

www.nhslothian.scot.nhs.uk

03 May 2017

Date 03 May 2017
Your Ref
Our Ref

Miss Caroline Reid
Trainee Clinical Psychologist
NHS Grampian
Older Adult Psychology Service
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

Enquiries to: Sandra Wyllie
Extension: 35473
Direct Line: 0131 465 5473
Email: Sandra.Wyllie@nhslothian.scot.nhs.uk

Dear Miss Reid

Study title: How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?
REC reference: 17/SS/0033
Amendment number: 17/SS/0033/AM01
Amendment date: 28 April 2017
IRAS project ID: 222947

The above amendment was reviewed by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

The Committee had no ethical concerns regarding this amendment.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Notice of Substantial Amendment (non-CTIMP)		28 April 2017
Participant information sheet (PIS)	Version 3	26 April 2017
Research protocol or project proposal	Version 3	26 April 2017
Validated questionnaire [RFQ46]		22 August 2016

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.



**Healthy
Working
Lives**

Headquarters
Waverley Gate, 2-4 Waterloo Place, Edinburgh EH1 3EG

Chair Mr Brian Houston
Chief Executive Tim Davison
Lothian NHS Board is the common name of Lothian Health Board

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

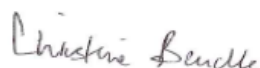
Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our Research Ethics Committee members' training days – see details at <http://www.hra.nhs.uk/hra-training/>

17/SS/0033:	Please quote this number on all correspondence
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Yours sincerely

A handwritten signature in cursive script that reads 'Christine Beadle'.

Mrs Christine Beadle
Vice Chair

E-mail: sandra.wyllie@nhslothian.scot.nhs.uk

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Ms Rebecca Whiting, NHS Grampian*
 Ms Charlotte Smith

South East Scotland REC 01

Attendance at Sub-Committee of the REC

Committee Members:

<i>Name</i>	<i>Profession</i>	<i>Present</i>	<i>Notes</i>
Mrs Christine Beadle	Research Nurse	Yes	Chair
Mr Ben Bullen	Acute Diabetes Specialist Podiatrist	Yes	
Dr Sara Smith	Senior Lecturer-Dietetics	Yes	
Professor Jill Stavert	Professor (Law) and Director, Centre for Mental Health and Incapacity Law, Rights and Policy	Yes	

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>
Mrs Sandra Wyllie	REC Manager

The Singh O'Brien Level of Engagement Scale (SOLES-16)

Please rate from 0 to 10 your agreement with the following statements:

1. I attend appointments with my keyworker

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

2. I need to see my keyworker regularly

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

3. I find seeing my keyworker helpful

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

4. I need to be involved with mental health services

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

5. I have benefited from mental health services

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

6. I have a mental health problem

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

7. I find my psychiatrist helpful

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

8. I need to take psychiatric medication

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

9. I find psychiatric medication helpful

10. I always take my medication

11. I feel I get enough practical support from mental health services

12. I feel I get enough emotional support from mental health services

13. I can cope by myself without contact from mental health services

14. Admissions to hospital have been helpful

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

15. I feel listened to by health professionals

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

16. I can get help from mental health services when I need it

0 1 2 3 4 5 6 7 8 9 10
not at all entirely

Appendix I: Participant Information Sheet



Participant Information Sheet

Research project: Mentalizing and interpersonal functioning in psychosis

We invite you to take part in a research study

What is the purpose of the study?

This project is part of an educational study. The information you provide will be used for a research project looking at social functioning in psychosis. The project seeks to uncover how negative life events may impact on social functioning in later life, and how the severity of psychosis symptoms and social functioning might then impact upon engagement with mental health support services.

Why have I been invited?

A member of your care team felt that you fit the criteria for taking part in this study, which includes:

1) experience of psychosis 2) over the age of 16 3) ability to provide informed consent

Do I have to take part?

No. You are free to decide whether to take part or not. Your decision as to whether to take part or not will not affect your level of care in any way. If you have any questions, please do not hesitate to get in touch. After you receive this sheet, you will have at least 24 hours to decide whether you wish to take part.

What will I have to do if I take part?

If you decide you would like to take part, you can either ask your key-worker to contact the researcher or contact us directly on the contact details outlined below, at which point we will arrange a time and venue to meet for you to take part in the study. The researchers will make every effort to be flexible in terms of your preferences for time, date and venue. The meeting can take place over one or more sessions, depending on your needs. This meeting will last approximately 1.5 hours. At the beginning of the meeting, we will go through the contents of this information sheet again and if you still wish to take part, the researcher will ask you for your written consent to do so. Then, you will be asked to complete six questionnaires and answer some questions, some of which will be audio recorded. Audio recordings will then be transcribed and

made anonymous, and then the original recordings will be destroyed. The questionnaires will ask you about your experiences of negative life events, how you get on with others and what it is like for you living with psychosis. The meeting will take place somewhere that is convenient for you. You can bring someone along with you if you like.

You are free to withdraw from the study until the 31st of March 2018, at which point the research project ends and the research team will no longer be able to trace the information back to you, as it will be made completely unidentifiable. If you do decide to withdraw from the study, this will not impact upon your care in any way.

What are the possible benefits of taking part?

The information you provide may:

- 1) Increase scientific knowledge of what the experience of psychosis is like
- 2) Improve services by increasing understanding of how to improve functioning and decrease distress for people with psychosis

What are the possible disadvantages and risks of taking part?

It is possible that some of the questions may be upsetting for you, as we will cover some sensitive themes, such as physical, sexual and emotional abuse. If you become upset, the researcher will listen to you and provide emotional support at the time, and will also offer you contact details for support services. The researcher will also offer you a follow-up phone call.

How can I find out about the findings of the study?

Once we have finished our research, we intend to post the findings on our website - <http://thepsychosisproject.wordpress.com> . We aim to complete the research by April 2018, so you can check the project website for updates from that point onwards. To note, we will not be able to provide you with information on your individual test scores.

Will I receive help with travel costs?

Unfortunately we are unable to refund your travel expenses directly. However, if you or your partner are in receipt of Income Support, Employment and Support Allowance (income related), Job Seeker's Allowance (income based), Pension Credit Guarantee Credit, and/or if you hold a valid NHS Exemption Certificate or you are named on a valid HC2 certificate issued under the terms of the NHS Low Income Scheme, then you may be entitled to receive help with hospital travel costs. To make enquiries about being reimbursed for travel costs, ask the reception staff at your local hospital to direct you towards the appropriate department. *Please keep any tickets or receipts as proof of your travel costs.*

Will my taking part in the study be kept confidential?

All information collected about you will be kept confidential, unidentifiable and stored securely. Only approved researchers will have access to your information. With your consent, your GP will be informed that you are participating in the study. If the researcher becomes concerned for the safety of you or others, the researcher may be required to report these concerns to your key-worker, and you would be informed of this in advance. With your consent, we will review relevant sections of your medical notes.

The study has been reviewed and given a favourable ethical opinion by the South East Scotland Research Ethics Committee 1.

If you would like to participate or for further information, please contact us:

If you are in *Lanarkshire*:

Julia Hannon

Phone: 01698 210 021

Email: thepsychosisproject@gmail.com
thepsychosisproject@gmail.com

If you are in *Grampian*:

Caroline Reid

Phone: 01225 557 474

Email:

If you wish to discuss the study further with the project's academic supervisor, please contact:

Dr. Angus MacBeth

Academic Supervisor

Lecturer in Clinical Psychology and Honorary Principal Psychologist

Department of Clinical and Health Psychology - School of Health in Social Science

The University of Edinburgh

Rm 3.06A, Doorway 6, Medical Quad, Teviot Place,

Edinburgh, EH8 9AG

Tel: 0131 650 3893

Email: angus.macbeth@ed.ac.uk

If you would like to discuss this project with someone independent of the study, please contact:

Dr. Ken MacMahon

Senior Lecturer in Clinical Psychology

Department of Clinical and Health Psychology

School of Health in Social Science

The University of Edinburgh

Rm 3.06A, Doorway 6, Medical Quad, Teviot Place,

Edinburgh, EH8 9AG

Tel: 0131 650 3932

Email: ken.macmahon@ed.ac.uk

If you wish to make a complaint about the study:

For Lanarkshire participants, please contact Kathryn Ferguson, Patient Affairs Manager, on 01698 858321 OR email Kathryn.Ferguson@lanarkshire.scot.nhs.uk

For Grampian participants, please contact Joanne Rodger, Senior Research and Development Manager on 01224 558457 OR email joanne.rodger@nhs.net

Appendix J: Consent Form

Mentalizing and interpersonal functioning in psychosis –Version 1 – 16th February 2017



CONSENT FORM



Title of Project: Mentalizing and interpersonal Functioning in Psychosis

Name of researcher:

Please tick box

1. I confirm that I have read the participant information sheet (version number ____ ; date ____) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered to my satisfaction. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐
3. I understand that relevant sections of my medical notes and data collected during the study, may be looked at by individuals from the research team, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records. ☐
4. I agree for my key-worker to be asked questions about how they think I engage with services. ☐
5. I understand that if I do or say something during the study that causes the researcher to become concerned for my safety or for the safety of others, they will be required to breach confidentiality and report these concerns to my key-worker. ☐

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6. I agree to my anonymised data being stored on the Edinburgh Research Archive for 10 years. After 10 years this status will be reviewed. I consent to my anonymous data being used for the purposes of future research projects for the public good. ☐
7. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the regulatory authorities and from the Sponsor(s) (NHS Lothian and the University of Edinburgh) or from the other NHS Board(s) where it is relevant to my taking part in this research. I give permission for those individuals to have access to my records. ☐
8. I consent to my GP being informed of my participation in this study. ☐
9. I consent to my interview being audio recorded and the recording being stored on the NHS Grampian and NHS Lanarkshire secure network. ☐
10. I agree to take part in this study. ☐

_____	_____	_____
Name of participant	Date	Signature
_____	_____	_____
Name of person taking consent	Date	Signature

Original (x1) to be retained in site file. Copy (x1) to be included in patient notes. Copy (x1) to be retained by the participant.